Paper

Apr. 6, 1951

WHAT CAN BE DONE ABOUT SWL DISPOSAL? . . . SEE PAGE 16

CAN HOT STOCK REFINING INCREASE YOUR PULP YIELD? . . . SEE PAGE 24

WOOD PULP

G

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CHARLES F. KETTERING

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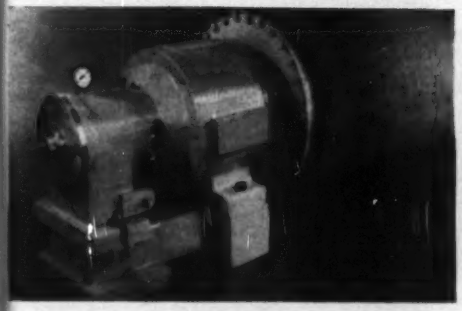

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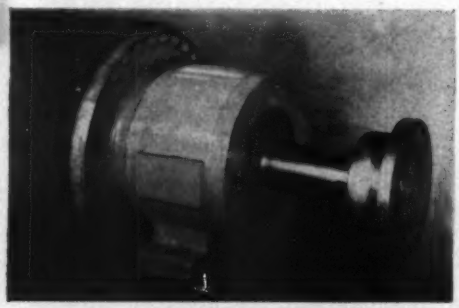

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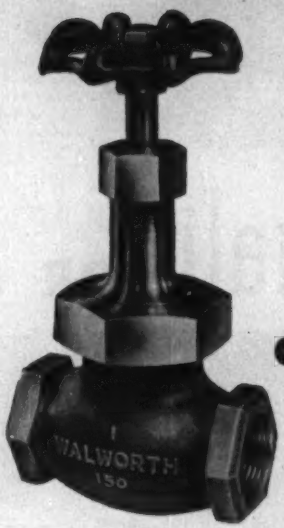

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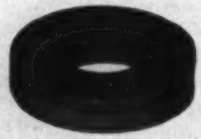

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Paper TRADE JOURNAL

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Vol. 132 **APRIL 6, 1951** **No. 14**

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PUBLISHED EVERY FRIDAY

LOCKWOOD TRADE JOURNAL CO., INC., 15 West Forty-Seventh Street, New York 19

Phone: PLaza 7-2370

GEORGE E. LOCKWOOD, President and Treasurer — ARTHUR E. GORDON, Vice-President — FREDERICK E. WINKLER, Secretary

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Entered as Second Class matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St., East Stroudsburg, Pa. Printed in U.S.A. Copyright 1951 by Lockwood Trade Journal Co., Inc. PAPER established Feb. 17, 1899, combined with PAPER TRADE JOURNAL, Nov. 16, 1899. PAPER established Sept. 21, 1910, combined with PAPER TRADE JOURNAL, February 19, 1926. All rights to the above titles reserved. Contents of PAPER TRADE JOURNAL, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission. PAPER TRADE JOURNAL is indexed in Industrial Arts Index and Engineering Index. Also publisher LOCKWOOD'S Annual DIRECTORY OF THE PAPER AND ALLIED TRADES.

NEXT WEEK

For an excellent explanation of the fundamental principle on which good forest management is based read "How are Your Forests Doing?" by Vernon E. Johnston.

A description of a new idea on the structure of Cellulose will be found in "A New Construction Formula for Cellulose as a Work Hypothesis," by Dr. A. Cmentak.

REMEMBER THESE DATES

APRIL 17-20: American Management Assn., 20th Nat'l. Packaging Exposition, Auditorium, Atlantic City, N. J.

APRIL 18-20: Second Coating Conference, Technical Assn. of the Pulp and Paper Industry, meeting to be held at the Statler Hotel, Boston, Mass.

APRIL 20: Alumni Dinner of Syracuse University, College of Forestry, Fraunces Tavern, New York City.

APRIL 24-28: The American Physical Society, Division of High-Polymer Physics, Ninth meeting at the National Bureau of Standards, Washington, D. C.

APRIL 30 - MAY 4: Materials Handling Conference; Held concurrently with Nat'l. Materials Handing Expo., International Amphitheatre, Chicago, Ill.

MAY 1-5: American Pulp & Paper Mill Supts. Ass'n, Northwestern Div., Spring Meeting, Radisson Hotel, Minneapolis, Minn.

MAY 7-13: Forest Products Research Society, Annual Meeting and Industry Show of 1951, Convention Hall, Philadelphia, Pa.

MAY 11-12: American Pulp & Paper Mill Supts. Ass'n., Penn. New Jersey-Delaware Div., at Hotel Easton, Easton, Penna.

MAY 13-16: American Institute of Chemical Engineers, Regional Meeting, Hotel Muehlebach, Kansas City, Mo.

JUNE 5-6: National Paper Box Mfrs. Assn., Haddon-Hall, Atlantic City, N. J.

JUNE 24-28: Superintendents National Convention, Multnomah Hotel, Portland, Ore.

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Payable in advance—Single Copy 15c—U. S. $5.00 per year— U. S. Possessions $7.00 per year.

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BACK LINER CHEST AGITATOR
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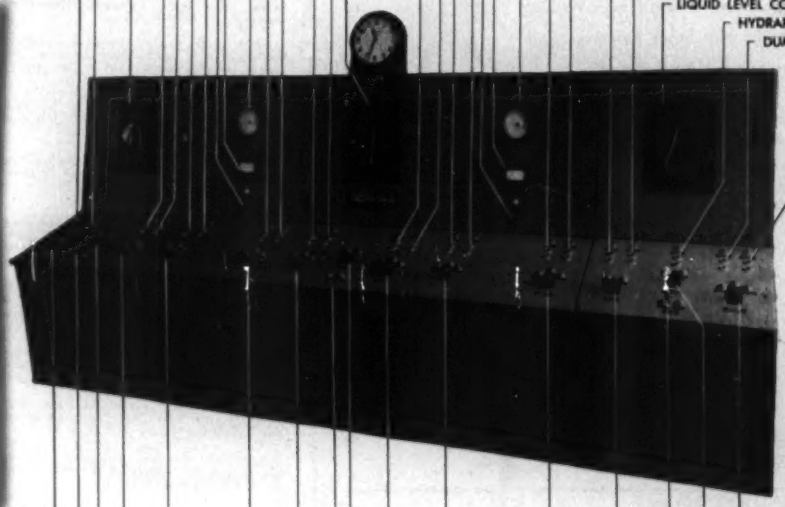

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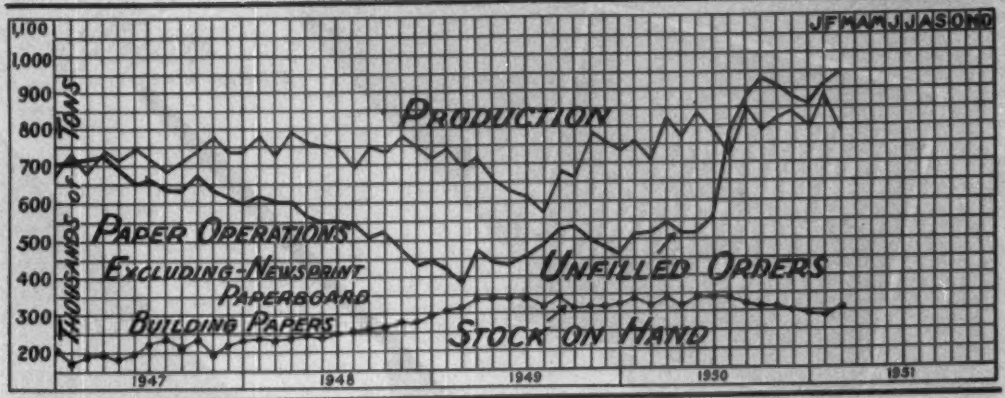
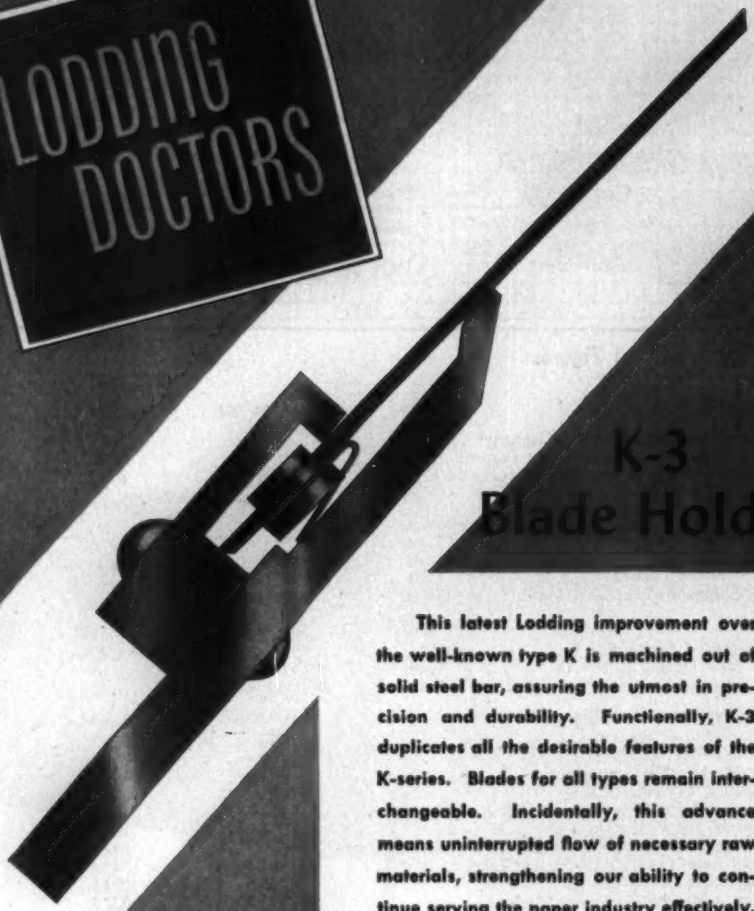


Weekly Brief of Important Figures

Source	Production	WEEK ENDING Mar. 24, '51	Feb. 24, '51	Mar. 25, '50
APPA	Paper Production Percent Capacity[5]	103.9	102.5	97.6
	Unbl. Kraft Paper Production Percent	99.6	92.6	96.6
NPA	Paperboard Operating Ratio Percent Inch Hours	105	105	95
		Feb. 1951	**Jan. 1951**	**Feb. 1950**
APPA	Paper Production[6] (Except Newsprint and Building Papers) ...Tons	794,000	892,000	726,000
	New Orders ...Tons	803,000	936,360x	737,000
	Unfilled Orders ...Tons	942,290	910,835x	516,865
	Shipments ...Tons	788,000	885,000	730,500
		Feb. 1951	**Jan. 1951**	**Feb. 1950**
NPA	Paperboard Production ...Tons	977,946	1,176,679	817,000
	New Orders ...Tons	987,609	1,349,991	802,800
	Unfilled Orders ...Tons	758,562	761,828	314,600
	Our Customers Activities Index[1]	**Latest Mo.[6]**	**Previous Mo.[6]**	**Year Ago[6]**
FRS	Manufactures Total Index	225	227	189
	Durable Mfg. Index	263	266	206
	Nondurable Mfg. Index	194	196	175
	Chemical Products Index	286	286	249
	Mfg. Food Products Index	150	160	149
	Printing and Publishing Index	172	180	157
ODC	Magazine Advg.-Printer's Ink Index	319	342	326
	Retail Sales Combined Adjusted Index	364.4	343.4	299.9
	Drug Index	230.6	224.5	220.9
	General Merchandise Group Index	375.7	332.5	290.3
	Grocery and Combination Index	422.5	424.4	356.0
	Prices Index			
BLS	Consumers Price Index[1]	181.5	178.8	168.2
	Wholesale all Commodities[2]	180.0	175.3	151.5
	Wholesale Foods[2]	182.3	179.0	154.8
	Commodities other than Farm Products and Foods[2]	170.2	166.6	145.8
	Wholesale Pulp and Paper[2]	196.5	189.0	155.9
	Purchasing Power of Dollar, Consumers Prices[1]	55.1	55.9	59.5
	General Activity Index			
FRS	Mfg. Production-Worker Payroll	424.9	415.1	329.2
	Unemployment Compensation Initial Claims (M)	1,080	1,051	1,725
	Miscellaneous Carloadings-Thousands of Cars	1,498	1,814	1,240
	Electric Output (Million KW hr.)	36,726	35,779	31,677
PTJ	Average 32 P & P Common Stocks as of Mar. 27	$37.53	$38.39	$31.66
	Average Indicated Dividends Common Stocks as of Mar. 27	2.34	2.39	2.26

[1] 1935 39=100 Unadjusted Index
[2] 1926=100
[5] New 6-7 day basis.
[6] For details see APPA Monthly Statistical Summary—February 1951 Estimated Figures
[6] Latest Month Available on Request
x Revised figures.

LODDING DOCTORS



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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, April 4, 1951.

Washington headlines of the past few days bespoke the anxieties of two honest men charged with our defense planning: (1) that we might not be ready for a possible Spring offensive of the Soviet; (2) that inflation itself might defeat our program.

In the light of current market weakness, it is important to note that the DPA Administrator, Charles E. Wilson, spoke of the long-term outlook.

Short Term Outlook Is Depressive

Some describe the short-term outlook as definitely deflationary. Business men are said to be worried about a depressive gap. Influence on the trend are top-heavy inventories in durables as well as nondurables, tightening credits and bank pressure for liquidation. What is evident is lack of buying power as consumers pay off their accumulated indebtedness of the post-Korean buying spree.

Monthly report of the National Association of Purchasing Reports just released tells of shelves piled with finished goods and industrial raw materials supply out of balance to current sales. An inventory recession like to that of 1949 is seen. Industrial buyers cut orders sharply in March, and many tried to cancel or to defer shipment, it was reported. Predicted is a decline in industrial activity and an increase in layoffs during this month and May. Shortages of materials have brought layoffs in anticipation of sharper curbs. Military contracts so far have resulted in make-ready expansions and have not increased production, it is said.

Cutbacks in key industries during the week effected layoffs of thousands of workers, particularly in automobile production, as metal shortages hit most of the plants.

Tapering off in the demand for tools, metals, paints, hardware, industrial machinery and supplies also is reported. The second quarter volume is substantially behind the first, and price reductions have been made to get volume business on items readily available from inventories.

Cotton goods makers are sober over a notable slackening in retail demand for shirts, sheets and dresses. Cloth is piling up, and converters are asking for 30- or 60-day delivery deferments. Unloading of swollen inventories of unfinished cloths at below mill prices has resulted in a number of mills stopping their sales. A further decline is expected for three or four months until the converters get their inventories down to normal, it is predicted. The short-term doesn't look good to cotton men and their bankers, though a pickup is expected by the Fall.

Particularly important to the wood pulp market is a growing weakness in rayon textile demand which has extended from the long fibers to the short. Rayon garment makers and converters are requesting mills to delay or postpone further shipments until they can move some of their stocks. Prices are slipping downward, market observers state, and a possibility of a cutback in rayon production exists.

The long-term outlook for rayons is so good that it is difficult for some to visualize current weakness. It must be reported that the evidence is at hand in daily reports from textile houses, from garment makers and from department stores.

Market Pulp Supply

Such a cutback would exert considerable influence on the market pulp supply and price. Not only have the rayon mills been gobbling up all the market pulp they could buy, but they have been unable to release any surplus pulp production to the general market. A lessening of rayon demand would immediately permit the mills to rebuild their pulp inventories. If of long enough duration, it should lift some pressure from Scandinavian pulp output.

At a time when rayon mills are reported to be getting deferments of orders, more domestic rayon pulp capacity is coming into production at the projected rate of 200 tons a day. Also domestic pulp capacity is expanding, and imports are averaging well over the 1950 monthly average of 158,800 tons. (January and February, 1951, averaged 212,685 tons from all sources. See page 38 for February imports table.)

1951 Wood Pulp Capacity

In a survey recently completed by the U. S. Pulp Producers Assn., 1951 pulp capacity for U. S. mills is reported at 17½ millions, exceeding that of 1950 by one-and-a-third millions, or 8 percent. Expansion programs now being processed will result in a further capacity increase of over a half million tons in 1952, raising overall productive capacity in 1952 to at least 18 million tons.

Indicated capacity by grades for 1951 is given as 3,123 million of tons of sulfite, 8,513 millions of sulfate, 472 millions of soda, 2,961 millions of groundwood, and 2,427 millions "others" —which includes special process pulps, i.e. semichemical, chemfibre, chemipulp, Bauer, neutral, sodium sulfite; all pulps other than groundwood produced without the use of chemicals, such as defibrated and exploded; chemical and mechanical screenings.

Of the two million tons increase scheduled for 1951-52, one million had already become operative on January 1, 1951, 21 percent will become operable during the first half of 1951; 18 percent during the last half of 1951; and the remaining 11 percent will become operable during 1952, it is stated.

Changes in capacity indicated are the result of new mills scheduled for operation; new facilities in present mills; improvements in existing facilities; changes in normal operating time; grade shifts. Expansion programs that have not yet progressed to the "action stage" are not included in the report. Other major projects contingent on the approval of Certificates of Necessity could result in substantial increase in capacity projections but are not included.

What Gain In Market Supply?

Of the actual figures supplied, none is definite market pulp. New market pulp capacity is involved in projected mill expansion, for which see March 23 issue.

In view of the near-term softening of paper and board demand, it is likely that some of this pulp will reach market pulp consumers. For the long-term planning of the Defense Program, this expanded domestic capacity is the probable tonnage which will be subject to the Controlled Materials Allocation for U. S. mills.

Swedish Pulp Prices Named

Major source of Swedish pulps have named their prices for April tonnages at $225 for unbleached grades and $250/$255 for bleacheds, on dock basis. Norwegian and other Swedish pulps doubtless will be priced this week.

Assurance that contract tonnages of Swedish pulps will be available at these prices is seen as a depressing influence on hard white envelope, new kraft cuttings, and other pulp substitute grades of waste paper. Some which have been buying heavily of these high grades now find their inventory condition unnecessarily heavy and are likely to unload while the price is right.

Paperboard New Orders Ease

A sharp drop in new orders for paperboards is presently noted. Back log of unfilled orders remains high however, and mills are operating at 105 percent of capacity. Inasmuch as paperboard is one of the industry's bell-wethers, it is worth watching as a trend.

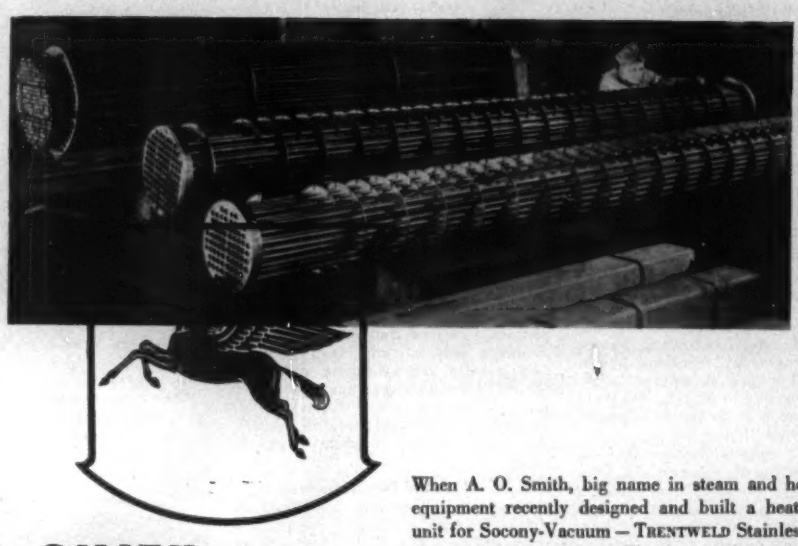
Easing of this rate of production would mean a drop in demand for waste papers, particularly the bulky grades which are now rising to a floodtide with Spring collections. It appears that the Supply and Demand will rollback prices without the aid of OPS. The drop in Chicago prices for *mixed* is $6 to $27, and in *news*, $3 to $35.

—E. P. N.

Paperboard Production (Tons)*

	Mar. 24 1951	Mar. 17 1951	Mar. 25 1950
Production	247,911	250,490	210,897
New Orders	188,865	245,852	186,128
Unfilled Orders	687,931	751,036	355,062

* Source: NPA.



A. O. SMITH designs with TRENTWELD

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And here's why: TRENTWELD is the product of tube specialists. That means you're assured uniform quality and specifications of manufacture that meet your most exacting needs. Then too, TRENTWELD is available in a full range of sizes—⅛" to 36" in diameter, in all grades and finishes. When the job requires stainless steel tubing, check with us. TRENT TUBE COMPANY, *Subsidiary of Crucible Steel Company of America*. General offices and plant — East Troy, Wisconsin; Sales offices in principal cities.

TRENTWELD

STAINLESS STEEL TUBING

News of the Week

Marathon Buys St. Regis' Oswego Mill

A contract for the purchase by Marathon Corp. of New York of the Oswego, N. Y., properties of St. Regis Paper Co. is announced by William L. Keady, president and general manager of Marathon, and Roy K. Ferguson, president and chairman of St. Regis.

The properties being acquired by Marathon consist of the kraft paper mill, the multiwall bag plant and the machine shop of the Engineering & Machine Division of St. Regis. Not included in the sale is the equipment in the bag plant and in the machine shop.

Under the terms of the agreement, St. Regis will continue to get a major part of the output of the kraft paper mill over the next several months. St. Regis expects a start in production around the first of next year by the new kraft paper facilities which it has presently under construction in Florida. During that period St. Regis plans to remove its bag manufacturing operations from Oswego.

Delivery of the machine shop building to Marathon, according to the announcement, will not take place until July 1, 1953, and in the meantime St. Regis will continue its operations in that plant.

Don C. Rawson will be the manager of the Oswego plant when Marathon takes over its operation. Mr. Rawson has been manager of Marathon's plant at Menominee, Mich., for the last 4½ years.

The Oswego properties, the announcement points out, will provide Marathon with an eastern production unit. Marathon plans to convert the former St. Regis mill to the manufacture of materials for the protective packaging of foods. Plans for conversion of present equipment and the installation of additional converting equipment are underway, but because of current shortages of vital materials no date has been announced for completion of the conversion program. When completed, the company expects to have about the same number of people as are currently employed at the Oswego plant.

An important and basic economic reason for the acquisition of these properties by Marathon is the fact that this company's largest woodlands and wood operations are located in the province of Ontario. From Marathon, Ontario, the company's pulp mill can economically ship to Oswego, via lake boat.

St. Regis has for several years been expanding its integrated operations in the South to gain the substantial economic benefits through utilization of the company's own wood for the manufacture of pulp in an integrated operation.

St. Regis' present construction of two kraft paper machines and pulp manufacturing facilities in Florida is designed to replace multiwall bag paper now produced in the company's northern New York mills from imported pulp.

Richard H. Boehm who has just been selected by the faculty of the Institute of Paper Chemistry, Appleton, Wis. to receive the 1951 Annual Student Award of The Paper and Twine Assn. of $150.00 in cash.
Mr. Boehm was graduated from St. Olaf College with a B.A. Degree in 1950. He is a member of the American Chemical Society and lives in Neenah, Wisconsin.

LEE PAPER ADDS MACHINE

VICKSBURG, Mich. — The installation and housing of a paper machine is the final step in a series which began with the rebuilding of Lee Paper Co.'s power plant in 1946, addition to their stock preparation capacity in 1947 and to finishing capacity in 1948, and consists of the construction of a building adjacent to and immediately north of the present machine room, 216 feet long by 114 feet wide, of two stories. This building will house a 130" Beloit fourdrinier paper machine and the necessary auxiliary equipment. The paper machine is designed to make the highest quality papers. It is being built by the Beloit Iron Works of Beloit, Wis. The building is being constructed by the Miller - Davis Co., Kalamazoo, Mich.

PLAN ADDITION AT NATCHEZ

NEW YORK, N. Y. — Plans for doubling the capacity of International Paper Co.'s new dissolving pulp mill at Natchez, Miss., were announced March 28 by John H. Hinman, president, following approval of the program by the company's board of directors.

The Natchez mill, opened last spring, has a daily capacity of 300 tons, or an annual capacity of 105,000 tons, of dissolving pulp. Additions planned to the mill will be a duplication of the present plant and will bring the total daily capacity of the mill to 600 tons.

Mr. Hinman said that a Certificate of Necessity has been approved by the National Production Authority covering construction of the new facilities at Natchez. Cost of constructing the addition to the plant will be met from the general funds of the company. The addition to the Natchez mill is expected to be in production by the fall of 1952.

PLAN DISSOLVING PULP MILL

OTTAWA — Canadian International Paper Co. will spend an estimated $500,000 for the construction of a plant to produce a new grade of dissolving pulp in Timiskaming, Que., following last summer's experiments which are described as successful.

HUMMEL & DOWNING ADDITION

MILWAUKEE, Wis. — A 3-story addition under construction at the Hummel & Downing division of Cornell Wood Products Co. will cost about $700,000 and is scheduled for completion in June. The work was started last July.

SPRUCE FALLS MODERNIZES

OTTAWA — Spruce Falls Power and Paper Co., Ltd., of Kapuskasing, Ont., plans a program to increase newsprint production by more than 12,000 tons a year. This will represent an outlay of approximately $5 million. Work is to begin immediately for the completion of the project before the end of 1952, subject to delivery of machinery and equipment, etc. The new program is a major followup to a long-term expansion plan that was started in 1947 but has so far been confined to the rebuilding of one newsprint machine and to community expansion.

With supporting pulp making facilities correspondingly enlarged, the Spruce Falls Power and Paper Co.'s project involves rebuilding of the three remaining paper machines, general mill and plant modernization program plus refinements in working conditions as well as additional housing facilities for the community. Arrangements have been concluded for the supply of power by the Ontario Hydro Commission to cover the additional mill and town needs.

Major components of the mill modernization program include a new upstream jackladder; a full-length belt conveyor for the woodyard; the installation of new jumbosize multi-knife chippers in the rossing plant; a new continuous-type grinder line for the groundwood mill, and installation of pulp vortraps for dirt and grit removal, one of the first installations of its kind in a Canadian newsprint mill.

NO MILL AT HALIFAX COUNTY

Due to the opposition to a pulp mill by the various civic groups in Halifax County, Va., the proposed project at New Boston has been abandoned. Interest has shifted to the Danville, Va., area.

BRIGHTWATER PLANS

NORTH ADAMS, Mass.—Construction of an addition to its finishing room is being considered by the Brightwater Paper Co.

Plans and specifications for an addition 200 feet long and 60 feet wide have been prepared by Charles T. Main, Inc., of Boston. These plans are now being circulated among contractors prior to the calling for bids.

WESTMINSTER EXPANDS

OTTAWA — Westminster Paper Co., Westminster, B. C., is proceeding with a $2 million expansion program. All necessary materials for a $400,000 building addition have been obtained and contractors have work under way. An order has been placed for a paper machine of 40-45 tons capacity daily with Beloit Iron Works. Completions will depend on material deliveries but schedule calls for operation by middle of next year. Present paper machines are working full time turning out in excess of 20,000 tons annually.

Burnham B. Holmes

The creation of a new and wholly independent box and paperboard division of Ball Brothers Company Incorporated and the appointment of Burnham B. Holmes to be general manager of the new operating group has been announced by Edmund F. Ball, president of the Ball firm.

PLAN MILL AT RICHMOND

The recently incorporated California Paper Board Co. on March 14 announced it had completed negotiations for a plant site in Richmond, Calif., and hopes to begin production of paperboard there soon.

BUY REGAL BUILDING

PULASKI, N. Y.—Announcement was made by Dimon Benson of the sale of the Regal Paper Co. building to the Greenview Tissues Corp., paper converters, who took possession April 1.

CRANE LEASES BROWN MILL

Pending completion of plans for the expansion of its range of products and the installation of new equipment now on order, the L. L. Brown Paper Co., Adams, Mass., has leased the manufacturing facilities of its Upper Mill to Crane & Co., Dalton, Mass. The L. L. Brown Paper Co.'s principal production is conducted in its Lower Mill, also in Adams.

NEW ROOFING PLANT

Sidney Roofing and Paper Co., Ltd., of Victoria and Vancouver, B. C., is now completing a plant at Lloydminster, Saskatchewan, at a cost of $750,000. Full-scale production is expected to be obtained by July. The plant will use asphalt from the Husky Oil & Refining Limited's plant nearby, and will produce saturated sheathing, asphalt saturated felt, smooth and mineral surfaced roofing, asphalt shingles and insulated sidings.

NEW BOX MANUFACTURER

JACKSONVILLE, Fla.—Miami National Container Corp., Jacksonville, has obtained a charter from the Secretary of State to deal in all kinds of boxes and containers. Authorized capital stock is 1,000 shares, par value $100 each. Directors: Samuel Kipnis, Harry Ginsberg, Marshall M. Bernstein, Jerome L. Kipnis, and Lionel M. Goldberg.

PEOPLE

GARDNER BOARD AND CARTON CO. announce the appointment of Raphael Block as coordinator of planning and scheduling for all operations, and the appointment of Charles K. Pigman as sales service engineer.

ST. LAWRENCE PAPER CORP.'s Norfolk mill superintendent, Vernon Waters, has resigned his position with that company to become superintendent of the mills of Knowlton Brothers, Inc. Mr. Waters will be the successor of M. Thomas Newcomb, who died January 26.

FIBREBOARD PRODUCTS, INC., with headquarters in San Francisco, announced that N. M. Brisbois, vice-president of the company, is now in Washington, D. C., serving as head of the Paperboard and Board Products Section of the Economic Stabilization Authority.

HOLLINGSWORTH & WHITNEY CO. announces that Edward P. Wood has been promoted to manager, Chickasaw Mills, Mobile, Ala. Mr. Wood has been assistant mill manager at Mobile since November, 1944.

LESAVOY INDUSTRIES, INC., has appointed Arthur Price vice-president. Mr. Price was formerly sales manager of Sears, Roebuck's Mail Order division, which included responsibility for Sears' catalog.

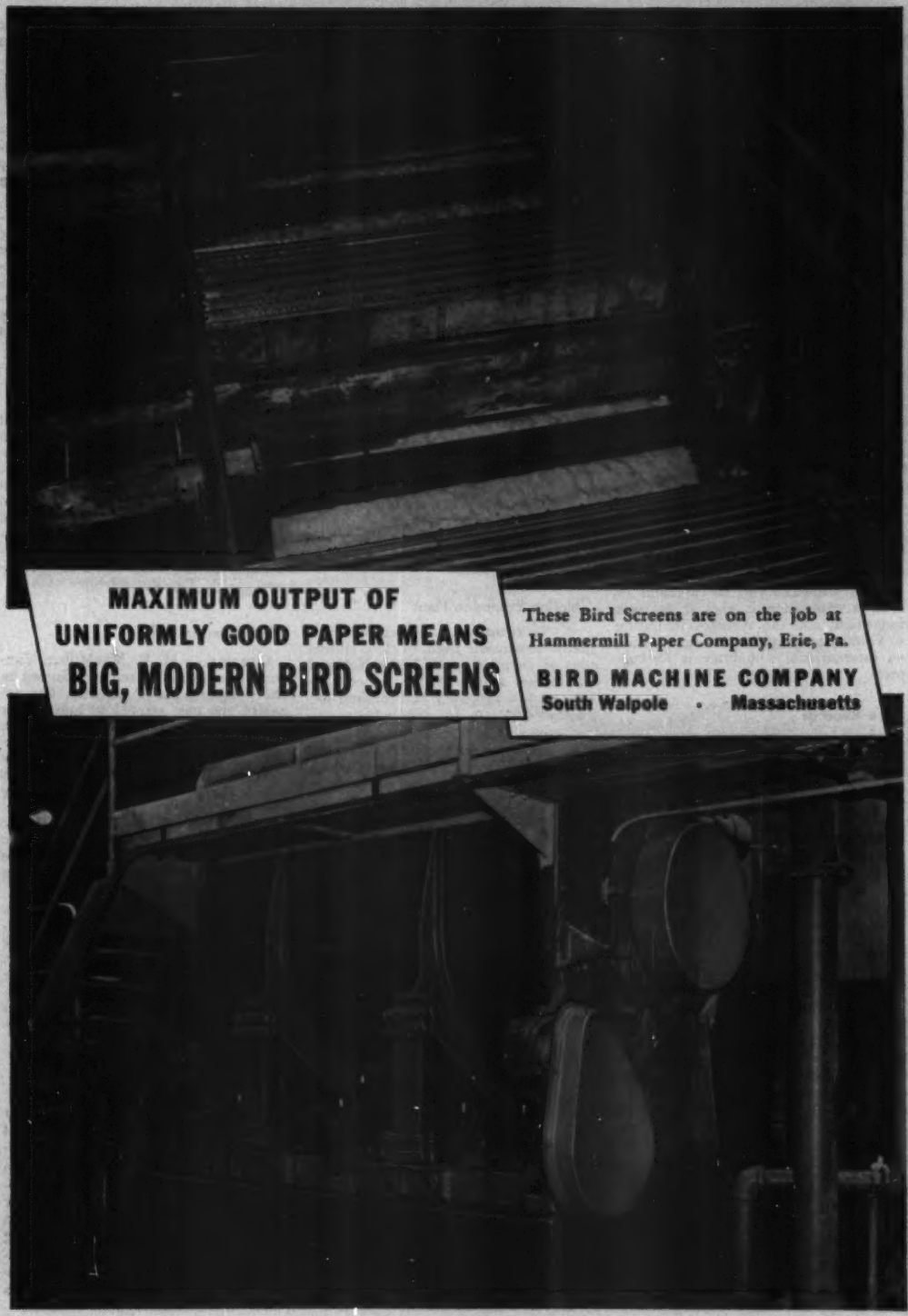
RIEGEL PAPER CORP. and Riegel Carolina Corp. have announced the election of Eugene Hoffman as assistant treasurer of Riegel Carolina. Mr. Hoffman is now treasurer of the Howard Paper Mills at Urbana, Ohio. He will continue as an officer of Howard but for the time being will be located at Riegel's New York office where he will serve as expediter of the new pulp mill now under construction at Acme, N. C.

UNITED BOARD AND CARTON CORP. has named States Tompkins, of the Carton Sales Division, manager of Laminating Sales.

Arthur W. Abrams, head cost accountant at Syracuse, N. Y., has been named assistant treasurer of the organization.

WOOD FLONG CORP. announces that Henry W. Fales resigned as chief engineer on March 1 in order to accept the position as assistant general manager of the St. Croix Paper Co., Woodland, Me.

MOSINEE PAPER MILLS have named Robert D. Rusch superintendent to succeed the late Arthur G. Fahrner. Wally Bryse has been acting superintendent pending his retirement in the early summer.



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BIRD MACHINE COMPANY
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GOVERNMENT GOSPEL

Steel Controls

OTTAWA—Pulp and paper companies' hopes of some relaxation or easing of present steel controls to allow construction or similar projects have been weakened now by the statement of Trade Minister Howe that more rigid restrictions will be required on steel production and use.

Equitable Newsprint Distribution

OTTAWA—It is understood here that Canada has been asked to become a member of the special international committee which will decide ways and means to distribute newsprint among world markets so that an equitable amount could be obtained by various countries. It has been known for some time that a number of countries have been seeking such a study to be made in the mutual interests of all free countries.

Certain countries have hinted that newsprint should be put in the same category as other scarce materials and be subject to international allocation by the North Atlantic Treaty Organization. Canada's role in functions of such a committee is ranked as most important, and the reported invitation to Canada to become a member of such an international committee is no surprise.

Price Records

WASHINGTON, D. C. — An immediate nation-wide check has been ordered by Office of Price Stabilization into evidence reported at the agency of "widespread non-compliance" with record-keeping requirements, Edward P. Morgan, an enforcement official, announced this week.

Meanwhile, he said, the office would shortly send to all regional and district offices a manual outlining in detail exactly what records must be kept by manufacturers and wholesalers.

Further Authorizations for Austria

WASHINGTON, D. C. — Further authorizations for expansion of the Austrian paper production launched some time back were announced by ECA this week, totaling $308,000.

The authorization covers commodities for kraft pulp and paper mill at Nettingsdorf for the Nettingsdorfer Papierfabrik Aktiengesellschaft, including industrial machinery, office machines, appliances and parts, with technical services. Purchases are to be made here.

No Container Control

WASHINGTON, D. C. — Controls on paperboard containers do not now appear to be necessary, although they are in tight supply, National Production Authority reported last week.

Members of OPS

WASHINGTON, D. C. — Members of the Office of Price Stabilization's Forest Products Division, headed by John D. Mylrea, of Wausau, Wis., were announced by the agency this week.

Director Mylrea joins OPS directly from the National Security Resources Board, but is on leave of absence from various posts with lumber and paper industry firms, including that of treasurer and director of Mosinee Paper Mills in Wisconsin; and Bay West Paper Co., Green Bay, Wis. Acting assistant director is Walter J. Damtoft, formerly assistant secretary-treasurer, Champion Paper and Fibre Co. Other appointments announced this week are: Norman O. Cruver, acting chief, Lumber & Wood Products Branch, on leave as president, Cruver Door Co., Tacoma, Wash.; Rufus I. Worrell, acting chief, Pulp, Paper and Paperboard Branch, Mead Sales Co., Inc., Dayton, Ohio.

Chlorine Expansion Plans

WASHINGTON, D. C.—Facing an estimated expansion need of 1½ million tons of chlorine by 1953, the National Production Authority has under consideration a proposed $215 million expansion program for the industry.

Certificates of necessity for 35 new plant and expansion projects have been issued to chlorine producers which would add 1,123,560 tons of chlorine per year.

Other industry representatives were critical of the tax amortization rate granted the chlorine program, especially in comparison with the faster rate allowed for iron and steel facilities. They urged that the chlorine facilities be given a substantial increase in the amortization rate.

Wool Rag Exports

WASHINGTON, D.C.—Export of wool rags from this country will be held to only the low-cost, low-quality rags for which there is little if any domestic requirement, the Office of International Trade announced recently.

In a conservation move to assure supplies for U. S. military and civilian needs, the agency said price would be one of the factors in determining whether an export license would be issued. A first-quarter allocation of 10 million pounds was recently announced for export. (EDITOR'S QUERY: Roofing Rags?)

Export Advisory Committee

WASHINGTON, D. C. — Formation of an Export Industry Advisory Committee to work with the Office of Price Stabilization on price control matters has been announced.

Dye Mfrs. Ask Limit on DO's

WASHINGTON, D. C.—A limit on defense orders to individual manufacturers for each color was asked by dye manufacturers this week, meeting with NPA.

Under their request a maximum percentage would be established on the amount of each color which a dye manufacturer must produce to fill defense rated orders. The suggested percentage was between 30 and 50 percent and would equalize and diversify the load upon the industry, producers told NPA.

Larson and Evans to NPA

WASHINGTON, D. C. — Appointment of two more industry men has been made by NPA. L. K. Larson, New York sales manager of Weyerhaeuser Timber Co.'s Pulp Division, and Robert H. Evans, executive assistant to the president of Olin Industries and president of the Assn. of Pulp Consumers, have been named pulp consultants to the Pulp and Paper Division, G. J. Ticoulat, director.

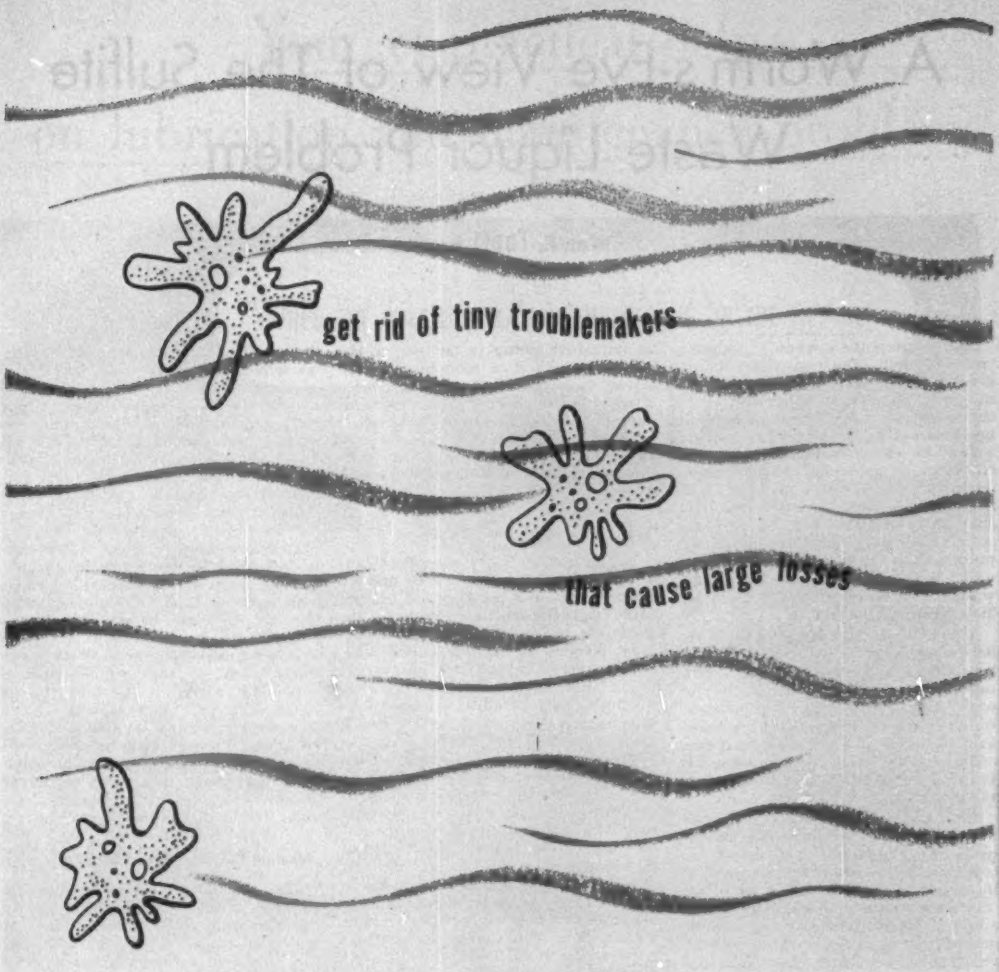
MacMillan on DPB

OTTAWA — H. R. MacMillan, Vancouver industrialist and well-known in the pulp and paper industry, has accepted the post offered to him by the Canadian Government as Canadian representative on the Defense Production Board of the North Atlantic Treaty organization in London. This board is charged with responsibility for the pooling of the defense production facilities of the North Atlantic nations to avoid situations where two countries set up plants to produce the same kinds of weapons, coordinating defense production of 12 countries.

He has served Canada in two wars. In the First World War, Mr. MacMillan was assistant director of the Canadian Munitions Board. In the Second World War, he was Timber Controller and later served as Chairman of the Wartime Requirements Board, member of the Wartime Production Board, etc.

No Canadian Price Control

OTTAWA.—Canadian pulp and paper industry has now learned officially that the Canadian Government is not planning to impose direct price controls, for the present. Prime Minister St. Laurent told an audience here that the Government will instead depend on a three-pronged fiscal policy, reducing spendable incomes by taxation, restricting credit and encouraging savings, indicating clearly and briefly Canada's policy in the battle against inflation.



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SERVING INDUSTRY...WHICH SERVES MANKIND

A Worm's-Eye View of The Sulfite Waste Liquor Problem

Wm. R. (Bill) Barber[1]

The worm is the lowliest of animals, creeping and crawling, soft-bodied, naked and limbless or nearly so; low in stature, his eye, if he has one, views the world of things from nethermost upwards. If he be ascribed a thought as well as an eye, homo sapiens might conjecture it as being a sort of hopeless what's-the-use over his own lowliness. Yet, he must sense a companionship, in nearness to him of more research chemists, who have descended to share his lot and his worm's-eye view[2] from long years of "the sulfite waste liquor problem," than there are his companion worms.

Sulfite waste liquor (SWL*) is the *bete noire*[3] of sulfite wood pulping; has been, still is, and, the worm's-eye ventures to see, will continue to be for who knows how long. It "pollutes" streams, rivers, bays and oceansides, so it has been said;[4] it is a "great economic waste"; its watery gallonage is fantastic as is also its tons of dissolved solids.

It *is* a waste, comprising as it does roughly one-half of the solids of the wood in its solution. Not strictly an economic waste from the viewpoint of the wood-pulping operation itself for derivation of the cellulose fibre.[5] It is a tantalizing stuff, of sort of mesmeric intoxication upon the research chemist, young and new with it or old and downtrodden by it. Rightly was it named "liquor"; upon the chemist fledgling with its first temptation it effects an exuberance of enthusiasm, an unreal-ish glitter in the eye; to the old hand with it, a monotony of the senses reinvigorated only by more draughts of intensified research efforts sure of "solving the sulfite waste liquor problem"; ruby-red from many woods, sparkling like wine, it can only contain possibilities beyond priceless estimation.[6]

With Apology To Mr. Tilghman

It might conceivably have been better in the long run if, with all due respect to him and his chemical genius, Mr. Tilghman had not disclosed his invention of cooking wood with calcium bisulfite in sulfurous acid solution to get paper-making fibres. He might better have followed out his lead of magnesium bisulfite. Conceivably, because it seems now to have relieved wood pulping of the "mother of necessity" leading to the ultimate developments in alkaline pulping and bleaching of, at any rate, co-development of the practicable and economic magnesia-base waste liquor disposal; had the latter's adjunctive recovery system grown up along with it, no one would question its essential normalcy to a sulfite pulp mill, any more than the recovery system is to a modern kraft mill.[7] Notwithstanding, the calcium-base sulfite process gave it its time "white" papers directly with no or less troublesome bleaching of the pulp which art was embryonic to say the least; "white" papers for more common and commoners' use than "brown."

SWL Chiefly Water

Seemingly, the chemistry-trained researcher could at the outset of his experiences with sulfite waste liquor apply withal a better perspicacity than by scruff-of-the-neck approach.[8] It is, as it comes from the pulp washers, a thermodynamically run-down system; energy has to be expended into it one way or another to resolve its components into anything worthwhile. It is chiefly water, at earth-surface energy potential.[9] Once its water be sufficiently removed by energy input its organic solids possess potential energy of combustion elementarily. Raising its organic solids in their water situ to potential energy levels by precipitations, by fermentations, et cetera, is only energies applied circuitously, than directly by heat evaporation of its water.[10] Its strong acidity, an acidity relatively mild from the near-spent sulfurous acid of the original cooking liquor but viciously fortified by organic acids derived from the wood, put a damper right away on practicabilities of other "disposal" than by sewering.[11] Nothing but the developments in metallurgy has made it possible to handle it otherwise, short of pre-neutralization, with added materials costs.

Alkaline Pulping More "Natural"

Patently, Nature did not intend that wood be reduced by acid-bisulfite in order to separate the cellulose fibres of and from their bonding substance, lignin. The acid at the high cooking temperature "degrades" the cellulose fibre, takes away or alters its primordially potential properties, mainly of strength but also in other substantial and microways.[12] Wood is more friendly by nature to alkaline reduction. To be sure, alkaline reduction results in a brown pulp, a circumstance which in the days of Tilghman and his contemporaries was a decided handicap in making "white" papers from the digester pulp without subsequent resort to any bleaching, or little and easier bleaching; good enough papers for coarse

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[1] Author's own Bio.: Allegedly, a chemical engineer; former member Executive Committee National TAPPI and interim vice-president. For other formers, see American Men of Science and Who's Who in Engineering.

[2] As opposed to Bird's-Eye View, airily panoramic from above; presumably chirping lightheartedly and gaily, not unlike the beginner in sulfite waste liquor research: "There must be gold in that 'thar' 50% of the log. Let me at it!"

[3] Used here and subsequently to abbreviate "sulfite waste liquor."

[4] French, meaning "object of fear or aversion"; "bugbear."

[5] Thus contributing to sale of sleeping tablets to pulp mill owners, executives, managers and their research chemists and engineers of mills located allegedly pollution-wise upon sewer drainages vulnerable to "clean-up or else" ultimatums of legislative bodies.

[6] "Strictly," because with calcium-base waste liquor it is more economical to sewer the relatively cheap spent lime and sulfur than to attempt their recovery for reuse in making cooking liquor. (Indeed, if they could be recovered practicably there would be no "sulfite waste liquor problem.") The pulp tonnage assumes the out-of-pocket cost burden. The "waste" might be the more meaningly a waste of natural resources, of half of Nature's handiwork in growing a tree.

[8] It might better have been called "sulfite devil's liquor."

[7] The author realizes he has been tempted to anticipate a lot of things before their respective times: Comparative cheapness and availability of calcium lime versus magnesia; metallurgical developments in acid-resistant equipment; capital investments and engineering problems involved, et cetera. Wishful thinking, especially in retrospect, while unproductive is not a heinous crime.

[9] The better-day researchers are, and have been, more so, having the mass of accumulated "what-has-been-dones" and "what-can't be dones" before them.

[9] Unhappily, sulfite pulp mills are located on non-precipitous terrain. Were they located commonly upon mountains, the SWL might be made to produce electrical energy by gravitational drop to a lower level.

[10] The author does not purport to write into this article case-worn history or technical data of no strict pertinence to the theme, the worm's-eye view.

[11] The Tilghmans, Benjamin and his co-working brother R., no doubt "disposed" of their sulfite waste liquor into the Schuylkill River, thus unbeknowingly becoming the first "pollutioners."

[12] Papermaking experiences of the author, and doubtless of others, have made suspicious that besides the known effects of non-fibrous substances upon sheet properties, there are some others of as yet unexplained effects; possibly some in micro- amounts, of vitamin-like nature.

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uses.[13] Developments in the arts and sciences of chlorine manufacture and brown pulp bleaching have resolved that handicap to white papers, with realization of better preservation of the cellulose fibre's innate properties.[14] Moreover, there can be conservation of the whole log; the spent liquor from alkaline cooking is immediately practicable of evaporation to combustible consistency without undue complications, yielding both "disposal" — our primary problem—and a large steam energy bonus, even disregarding any smelted chemicals return for cooking liquor-making reuse.[15]

It is of pertinency to the "disposal problem" that alkaline pulping[16] has certain other advantages. It need not be thought of solely as full-soda or full-sulfate; there can be gradations of sulfidity between the two extremes. At a point of semi-sulfidity an easy bleaching pulp may be had of strength properties comparable to an unbleached sulfite, and since it has to be bleached for white papers has the added attractiveness of whiter color.[17] Alkaline pulping permits of a wider diversity in grades of papermaking pulps from diverse available woods.[18]

Drawbacks To Alkaline Conversion

The great drawback, the millstone about the neck (of acid-sulfite to alkaline conversion), is, of course, the tremendous investments in the sulfite plant, investments firmly fixed except by resolution to virtual capital-confiscatory scrapping, with new large investments piled onto that, and the greater so in the cases of plants expensively modernized with all the appurtenances of acid-resistant indirect heaters, et cetera. Unfortunately, the conventional brick-lined shells of sulfite digesters can not be utilized for alkaline pulping as they are nor practicably so converted. Nevertheless, there might be cases where the resolution to change-over could be in the long run the shorter, though rough, road to satisfaction and peace of mind over the "disposal problem."[19]

[13] The times were economically significant: Civil War inflation followed by the '73 depression. Maybe the latter had something to do with Tilghman not persisting in his "find" to commercial perfection; may be he ran out of financial backing. Anyway, his new way of making pulp for papers, of competitive advantages over soda-pulp-made, seems to have lost its savor. It is recorded (Manufacture of Pulp and Paper, Vol. III) that there was a drop in the price of soda, for one thing.

[14] At any rate (alkaline reduction), for papermaking. The author is not forgetting the acid-bisulfite cellulose recovery process for notable non-papermaking chemical conversions. However, he ventures that these too are a longish way to comparable perfection from alkaline-cooked wood.

[15] Of particular noteworthiness is that the smelted chemicals can be returned readily convertible to identical compositions of the cooking-liquor chemicals.

[16] Sodium base, of course.

[17] This has to be taken with a grain of salt: Some folks make unbleached and bleached pulps better than others; some would make the semi-sulfidity alkaline pulp better than others.

[18] And, in the author's estimation, better papermaking pulps, papermachine operation-wise and quality-wise. Perchance his estimation has been warped from having participated in difficulties, real or unreal, of making certain sulfite specialty papers from Pacific Coast woods as naturally come-easy, seemingly, as from Eastern spruce.

Constructive Progress Made

So, under actual or prospective ultimatum, the perplexed sulfite pulp mill management resorts to earnest conjecture toward all "disposal problem" possibilities, from plain schemes which sound good on paper to specialized chemical and engineering research, by view of saving his own skin and a due sense of public interest. That millions of dollars and years of time have been expended upon "the problem," and by brain talent from Z to A is only repetitious to remark. As much as so wishfully thought, there have been no miracles performed, no rabbits-from-the-hat, and never will be. One thing is certain: That sulfite mill owners and executives have come to that clear understanding.[20]

Constructive progress *has* been made and is continuing to be made by the present-day determined efforts of the industry. A most significant and primary element of progress has been in the attitude toward the "problem," by both the alleged pollutioner and the alleged pollutionized; the former to an open-faced cognizance of it, impressed the more by experiences with or observations of the insatiable futilities of litigation; the latter to a sympathetic recognition of its inserent difficulties by legislative bodies and commissions coupled to awareness of the industry's essential and irreplaceable economy to the Nation and to their own locales.[21] Cooperation between sectional sulfite pulp mills, the sharing of efforts and knowledges; National cooperation of sections contributing to amalgamation of efforts; research programs and pilot plants supported sectionally and Nationally; all comprise the newer outlook of the day.[22]

Each Pulp Mill Separate Case

The "problem" is not one of common and identical features to every sulfite pulp mill. Far from it. Only the generalizations of "disposal" possibilities apply thusly. A foremost one of those generalizations is that each pulp mill presents an individually characterized case. It is the foremost one the SWL chemical engineer makes use of in forming his judgment of what *may* be done at a particular plant in the way of "pollution" alleviation, partial or whole, stop-gap or permanent. His procedure is, in its entirety of sequence, analogous to the physician's approach to an unfamiliar patient, ill but to what degree and to what diagnosis and prescription yet undisclosed. Maybe a simple change in the patient's sanitary surroundings will effect the remedy; maybe some time for observation of the symptoms is required, supplemented with preliminary explorations; maybe a simple operation will stay the disease; maybe a costly major operation is indicated for permanent relief.

[19] The Worm's-Eye View does not assert that alkaline pulping can reduce "pollution" to zero. The dilute black liquor sewer effluent in such meager amount as it is, does carry a BOD,* incomparably smaller, however, than that of sulfite waste liquor effluent, and influenced a lot by the efficiency of retention of black liquor residuals from mill escape. Any sewage, regardless of source, may by circumstances be allegedly "polluting."

* Used here and subsequently to abbreviate "biochemical oxygen demand."

[20] The author has no bone to pick with anyone's scheme, pet, magical or otherwise, for "solving the SWL problem." He has scrutinized hopefully many of them, plain and fancy, and has experimentally practiced some himself, not excluding occasions of wishful thinking.

[21] By worm's-eye view a goodly portion of this healthful change can by just due be ascribed to the technical man, persistently science-minded that what is so is so.

[22] And, from worm's-eye view, high time: The first bulk and commercial-scale breakdown of SWL and utilization of its lignin in conversion to by-products was, as recalled, the Howard Process two decades ago.

[23] "Watercourse" so as to be inclusive of all drainage waters; creeks, streams, rivers, bays, oceans.

[24] By analogy again, there is a difference between prescribing for the illness of a ninety-year-old patient versus a thirty-five-year-old.

[25] Not uninfluenced by homo sapiens' propensity for cutting down trees.

[26] Also of course, like measurements of any other mill sewer effluents than SWL should they exist, such as from an alkaline pulping plant, papermachine, bleach plant, by-products plant, mill domestic sewage, et cetera.

Elements Of First Scrutiny

Returning from analogy, the chemical engineer's first scrutiny becomes the size of the pulp mill, i. e., its pulp tonnage whereby the gallonage of sulfite waste liquor co-produced can be readily estimated. This is of first note because it bears directly into the next scrutiny, the nature of the watercourse receiving the sewer effluent.[23] Concurrently he will size up the age of the plant, its degree of modernization or obsolescence, since this may become of decisive significance.[24] The relation between the total units of BOD sewered (gallons × BOD per gallon) and the estimated BOD burden the watercourse will stand is, of course, of prime importance, and may perchance indicate that a change in position of the sewer outlet will be remedial.

Watercourse Survey Important

The margin of further possible BOD burden upon the watercourse may not be surely enough estimated from scrutiny of its available data of water movement. First-hand observation of what sewages from upstream or contiguous—pulp mill or other industrial and municipal—are already contributing to BOD diminishing, and known seasonal watercourse fluctuations in quantity of flow are noted. These preliminary estimations lead to decision whether a biochemical survey of the watercourse is necessary, to replace estimations with factual data. In the case of most streams[25] there will have to be seasonal repeat, high and low water, surveys, and comprehensively to disclose BOD conditions sufficiently far above and below the plant, sometimes quite far below. Concurrently, measurements of gallonage of strong sulfite waste liquor produced and its BOD, the gallonage of sewer effluent and its diluted BOD, again replace estimations with factual data which established the BOD load from the plant upon the watercourse.[26]

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Where more than one plant exist at neighboring distances and contributing sulfite waste liquor effluents to the same watercourse, the biochemical surveys of it become obviously sensible joint projects. Furthermore, a foresightedness will be a closely informed state sanitary board or commission concerned, if not an actual technical representation in the survey so as to have anticipated any subsequent suspicion or taint of factual data non-disclosure. And even though the watercourse is beyond question overloaded by observation and general prior knowledge the survey is valuably desirable because it establishes the pre-remedial condition as regards that particular plant for post-remedial comparison.[27]

Pulp Mills' Sizes Gradated

Upon acquaintance with the environments of the plant, its size in pulp tonnage and sulfite waste liquor gallonage coupled with the estimated BOD capacity of the watercourse—fortified by any extant or accumulating survey data — it becomes next-wise and so soon-wise to form a pretty reliable forecast as to what is going to be possible to do and not to do.[28] It is at this point that the "big fellows," the "medium fellows' and the "little fellows," meaning in their comparative pulp tonnages and thereby gallonages of sulfite waste liquor become separable.[29]

Assuming the circumstance that neither a small nor a goodly partial effluent BOD reduction can satisfy his case, the "big fellow" can not hold too much promise in bits-and-pieces[30] "disposal." He is confronted with a wholesale, not a retail, situation. He has to do something singly big or collectively big. His is a matter of bulk "disposal." The "little fellow" has the better promise of retail or bits-and-pieces "disposal." The "medium fellow" is positioned betwixt and between.

From "Simple" To "Complex" Measures

So where does the SWL chemical engineer go from there in his studied judgments. His ultimate recommendation—single or plural, one or alternative—will be arrived at from many elements of consideration. It seems he must disregard any question of finance availability—which is, after all, none of his business; anything done is going to cost money and likely in a large dose. All he can do is to proceed with eye upon but one thing: What appears to be the most sensible way, or ways, to that particular plant's "solution of the problem." He is disposed to place his emphasis upon a permanent "solution" rather than upon any more or less temporary one,[31] though he will present the latter for equal consideration should it be a more immediate "solution," and perchance one of such long enough time-being as to provide virtual permanency. At any rate, he is going to proceed according to what seems to him to be from the simpler to the more complex; from simpler in something which may be already there to take advantage of, to the more complex of going into the wholesale by-products business.[32] "Solutions" which, though seemingly too costly at the time, will better the pulp mill's own business in long-range and insure its economic durability and competitiveness in that respect[33] comprise the middle-ground. He can not, however, make financial return on the "disposal" investment a compulsory requisite; that can, and should of course, take a high preference, but withal the "solution" cloth will have to be cut to fit the particular "problem" physique.[34]

"Simple" Measures

Simple measures of "solution" in something already there to be taken advantage of are fortuitous indeed, and exist at few sulfite pulp mills.

(a) Change In Effluent Outlet

Change in position of the sewer effluent get-away can be ranked as for first scrutiny. This is efficacious where the watercourse and its water-movement are large enough and fast enough to provide quick SWL dilution to the prescribed BOD requirement. Assumably the change will require more sewer piping. The added pipeline may need to be lengthy, will need to be of corrosion resistant material and the laying of it will involve some engineering problems; it will need to be submerged for at least some proper length of its discharge end and be provided with multi-distributing outlets so as to disperse the effluent as widely as possibly practicable for quick mixing and dilution. This measure may be of temporary or permanent "solution" as here defined, and is one applicable to the big, the medium or the little fellow alike. Even though it will contribute but a goodly partial "solution" it comes within the SWL chemical engineer's consideration to its fullest possibility.[35]

(b) Ponding

Ponding, or impounding, of the strong SWL is another simple measure for scrutiny where the circumstances of terrain for an appropriate ground spot for the pond and an uninhibited[36] human inhabitation are happily joined. It too will likely require new lengthy pipeline. The engineering problems will, however, be of a different nature. They will arise regarding the pond rather than the pipeline. Furthermore the ponding measure will apply with best fortuity to the "little fellow," by lesser chance to the "medium fellow" but likely not at all to the "big fellow" for obvious reason. It can be considered under only two circumstances; where the watercourse has a seasonal low water flow or an advantageous periodic water-movement fluctuation. Under the first, the entire quantity of SWL produced during the low water period has to be held for dumping during high water; perhaps not all of it held depending upon the watercourse. Under the second, a periodic or slow continuous discharge from the pond at the rate of SWL made can be year-round "disposal."

But ponding is a measure to be most cautiously approached. The engineering of a leak-proof pond, dependable and durable for holding strong SWL will give the designing engineer not only immediate worry but inner after-inequietude over his handiwork as well. It is better to construct it in separated units and with deep enough posthole wells around the outside of the units and the whole pond to enable subsurface sampling for detection of leakage. Thus the advantage of the unit construction will be the possible detection and assignment of seepage to lining inspection and repair of a small portion of the pond rather than the monstrous one of the whole pond.[37] What the SWL chemical engineer must consider too but which design can not handily

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[27] Repeat surveys post-remedial—if any—are part and parcel.

[28] The satanic cruelty of calcium base SWL always occupies the road; the bete noire; the Great Obstacle.

[29] For arbitrariness, let's call the l:f.'s 50 to 100 tons, the m.f.'s 100 to 200 tons, the b.f.'s 200-plus tons.

[30] Thought of by the author as recourse to measures which do not utilize sufficient quantity of SWL to reduce the sewer effluent's BOD and/or other aspects to satisfy sanitary regulatory requirements. By-product plants fall generally under the term, unless carried to the largeness of "disposal"—satisfying removals. What is a large capacity alcohol plant to a b.f. may still be bits-and-pieces; while to a l.f., one sized to reduce BOD to the satisfying level could be a "solution."

[31] Let's call "solution" the application of those measures which do satisfy the sanitary regulatory requirements.

[32] Going into the by-products business is here regarded as the "more complex" because it is not pulp and paper business. Once a costly capital investment is made in a by-products plant depending upon SWL as raw material for its life, the pulp mill is stymied as to possible later change or changes, abruptly or gradually, away from acid-bisulfite pulping, for economic reasons or for reasons of complete or improved measures of "solution." In common expression, the by-products plant becomes a millstone around the pulp mill's neck; unless, of course, it falls into line of removal and conversion of enough SWL to effect "solution" of itself.

[33] In particular where manufacture of specialty papers is integrated.

[34] Let's remember we are dealing with pulp mills under subject of the do-or-else "problems," immediately, in a near future or prospectively. Calcium-base sulfite pulp mills earnestly desirous of "doing something" expensive from motive solely of economic conservation of the other half of that log can, from the author's observation, be counted on less than the remaining whole fingers of an old-time papermachine man's right hand. We are not forgetting those who install better conservation of wood via acid "semi-chemical" pulping. It, however, lowers the pulp quality for papermaking.

[35] A partial "solution" may provide the needed margin for some other co-measure.

[36] Not "persnickety."

[37] By its design and construction the pond must be sealed against leakage beyond any question. Factors of changes in SWL volume from full to empty, from hot SWL to cold, from seasonal temperatures distortion and cracking—even micro-cracking—of the lining, from inadvertent wandering of neighborhood weighty animals of horny hoof; against all the design and construction must make guarantee. SWL has the notorious reputation of seeping out of impoundage and tainting people's wells or otherwise causing mischief, alleged or real. Don't build your pond directly upon natural soil even though its location might be "forty miles from nowhere." The stuff is apt to show up in Timbuktu. The only apparent exception is where any subsurface leakage can not possibly go anywhere else than into the watercourse. Furthermore, lengthy underground travel tends to make it odorous, presumably from reduction by ground bacteria of its sulfur constituents to organic sulfides.

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help will be the unavoidable wafting of characteristic SWL vaprous smells by breezes from the pond's surface. These are not unpleasant at respectable distances from human inhabitation though responses therefrom seem to be different from some than from others. Stagnating impoundage, i. e., with no periodic or continuous turnover provided for, with atmospheric evaporation depended upon for its disappearance must except under very unusual circumstances be shunned. Stagnating SWL does "decay."[38]

(c) Activated Sludge Plant

A simple measureof "solution" to be taken note of advisedly will be the location of the pulp mill's SWL effluent to be handily combined perchance with a municipal sewage for an activated sludge plant benefiting both parties upon the same watercourse. This measure can apply only—and to the "little fellow"—where the volume of municipal sewage is great enough in relation to SWL volume to bring the latter to a low BOD dilution somewhere comparable to that of the former and to provide a sufficiency of nitrogenous and other sludge activating content for the bacterial digestion.[39] Presence of SWL in overpowering quantity inhibits efficacious sludge activation. It is needless to point out that under the best of municipal versus SWL sewage volumes relationship the strong SWL multiplies itself BOD-wise to huge gallonage proportion. The measure has the advantage of the municipal activated sludge plant being a watercourse sanitation *must* of itself, and will be something dependably in permanent operation.

If not already in existence, the pulp mill will need to instigate the joint project, probably providing very substantial part of the cost of construction; certainly of chemical engineering design and technical assistance in its operation since the onus of its success rests by implication upon the pulp mill. Here again, however, the BOD conditions of the watercourse will have been made sure of to predicate a marginal BOD reduction safety factor. A municipal activated sludge plant already existing, the pulp mill again assumes the onus; in convincing the authorities that inclusion of the SWL will not upset their own sewage disposal, and in bearing the costs of the expanded capacity.

(d) Trickling Filter

The trickling-filter plant measure will be there to be given scrutiny though it is apt to be at the bottom of the simple measure list. Practicable only for small volumes of SWL, not great in its apparent capability of BOD reduction at practical maximum operable efficiency, erratic and touchy in continuity of reduction, needing acres of ground for any sizeable capacity, requiring great volume of dilution of the SWL, requiring substantial maintenance costs in activating chemicals and of its filter beds, its feasibility even for a "little fellow" would seem not very hopeful.[40]

There may exist some others of the here defined simple measures of "solution" at a particular pulp mill. Those commented upon may be said to be typical of the fortuitous circumstances.

"Complex" Measures: By-Products

From purpose and intent, the here defined more complex measures of "solution," that is, going into the wholesale by-products business, will not be commented upon extendedly. The average run of sulfite pulp producer has a natural and pardonable sluggishness of enthusiasm in taking on a line of business outside his beaten path, strange to him in its manufacturing and sales aspects. New and large capital finance will have to be provided and a predicted return upon it assured, at least enough to take care of depreciation and amortization, if not yet profit. He has to be pretty hardly pressed in necessity of "solution" of his SWL "problem" and/or possess a business perspicacity which makes him amenable to conviction before embarking into co-products not of familiar papermaking nature.

SWL Research Highly Specialized

It is in furthering the possibilities of the more complex that the highly specialized researchers into the complexities of the organic chemistry of sulfite waste liquor have their day.[41] To call the chemistry of it complex is whispering. Its main constituents have been known for a long time; namely, water, unspent sulfurous acid and bisulfite, lignin somewhat as yet mysteriously but certainly radically altered from its "native" state, and sugars derived from the wood and from acid degradation of the wood's cellulose. The list of chemical constituents ends not with these, by far, but are the ones present in significant percentages. From the researches of the past a few industrial by-products utilizations have been capitalized upon; more are in various states of semi-commercial scale developments; some more are still in the laboratories; a few seem to have fallen by the wayside, discouraged or awaiting a new lift or used in inconsequential amounts.[42] The SWL researcher finds himself from necessity delving always more deeply and more complexly into the chemistry of the main ones and, for fresh fodder, into that of the lesser and the more unknown ones.

(a) Into Industrial Alcohol

Industrial alcohol has been fermented and distilled from SWL sugar for many years, though for not many on the American Continent. So has vanillin and 'plastics' of diverse sorts from its lignin. Too bad it is that their markets are so saturable from the economic viewpoint of the sulfite pulp mills. From the viewpoint of the manufacture of an indispensable industrial raw material used in great quantities, it would be nice if the market would afford to *every* wood pulper who chooses to remain living with acid-bisulfite a next-door alcohol plant utilizing his entire output of SWL, from the motive of natural resources conservation if not from profit. Yet, it is a commodity the market for which will grow as chemical industry itself grows, and in the ultimate outgrow the incidence of SWL-producing pulping. Fermentative alcohol processing is age-old, with simple adaptations to SWL. It is in the foremost regard of the by-products "solutions." While it does not reduce its spent SWL's BOD to near zero it does remove the BOD "quickies" of sulfurous acid and bisulfite, substantially that of the insidious sugars and some degree of the slow-moving BOD of the lignin; in total a considerable reduction. According to the watercourse and the size of the pulp mill it can effect a satisfying or near-satisfying "solution" and is always open by expanded capacity toward utilization of the entire quantity of SWL produced, if not thusly at the outset.

(b) The Howard Process

The only other bulk "disposal" by-products utilization of SWL has been the Howard Process of gross lignin precipitation from the strong liquor by hot liming and its conversion to vanillin and "plastics."[43] The discharged portion is greatly reduced in BOD, though the non-filterable lignin and the alkaline-carmelized sugars impart a brown color to it as a sewer effluent.[44]

(c) Fodder Yeast

In semi-commercial scale SWL by-product development is the torula-fermented "fodder yeast," of undoubted nutritional value in fortifying animal feeds. Fodder yeast has the good chance of becoming established full-commercially as one more bulk SWL utilization, since it could conceivably market a considerable quantity of SWL extract.[45] All is not gold that glitters in the fodder yeast business. "Selling" it to the position of an established commodity of valuable use and

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[38] Upon dilution into a stagnant or semistagnant watercourse the stuff has a predilection for forming sphaerotilus slime in massive cluster upon whatever is handy to fasten itself; of nauseous smell above, especially, shallow waters, to which it may add other disfavors when becoming dislodged from its moorings. This predilection is attributed to the natural nitrogenous content of the water not being sufficient for bacterial digestion of the SWL's sugars otherwise.

[39] Bacterial "food" chemicals may be artificially added.

[40] At any rate, in the author's opinion.

[41] The Worm's-Eye cannot refrain from adding: "like any other dog." Also, not at all disparagingly, "have had their day for a long time."

[42] So far as quantity of SWL utilized is concerned. We speak only for the American Continent.

[43] And probably others by now, of the author's unacquaintance. Existing commercial scale extract of bakers' yeast from SWL is not overlooked; from quantity of SWL utilizable the author chooses not to class it under bulk "disposal."

[44] Considering the significant barrenness of the SWL by-products field after so long a time, the Continent's sulfite pulp industry owes a living monument to the late Guy Howard, to a fine man, to his practical research genius and to his pioneering courage.

[45] Presently by virtue of exemplary pulp mills' cooperative effort.

producing it to be saleably priced are one end of the string which quantity production and good salesmanship, both technical and ordinary, may shorten. The process effects a very considerable BOD reduction, comparable to fermentation to alcohol, and can thereby become a good partial if not satisfying "solution." It too like the alcohol plant has the advantage of real increases in raw SWL removal by expansion as market development for fodder yeast may indicate.

(d) Smaller "Bits-And-Pieces"

Smaller bits-and-pieces measures by the by-products route can hardly receive any major consideration in "disposal" that "solves the problem," whatever their worthwhileness might be in results of chemical research and/or money-making possibilities. There may be, and likely are, many unrevealed values latent within the solids of waste sulfite liquor; time, patient chemical and engineering research, evolving economic changes will bring them to fruition.[46]

The "Middle-Ground" Measures

The middle-ground measures of "solution" are here defined as those which will better the pulp mill's own business in long-range and insure its economic durability and competitiveness in that respect, in particular where the manufacture of specialty papers is integrated.

(a) Conversion To Alkaline Pulping

The most radical of them, change-over to alkaline pulping has been mentioned in its more natural chemistry of the reduction of wood for its cellulose fibre. Radical as it might seem, and costly as it would be, a full consideration of it may by reason of circumstances, become soundest of thinking. Age of the pulp mill, its degree of obsolescence and amortization, availability of wood species not readily nor at all pulpable by acid bisulfite and perhaps the more emphasized by concern about continuity of supply of those in use, enlarged scope of pulp grades including the more readily alkaline-pulped "semi-chemicals"[47] and thereby a wider diversity of paper grades, estimated cost of complete change-over versus cost of and speculative success with, calcium base or other base adjunctive recovery systems, are factors not to be lightly dismissed.

[46] It would seem that Nature imposes upon the SWL researcher a tether against any such impressive leger-de-main of chemistry as happened in the case of coal. For such as that he was "born thirty M-millenniums too soon"; he is battling with Nature in infancy, the tree. "If the stuff only had some good old-fashioned honest-to-goodness love-lorn benzene rings in it to start with!" Come to think of it, pending—per pond precautions mentioned—all the strong SWL made in one year on this Continent at some desert place and permitting Nature to take her course for a few million years, would be a relaxing SWL research project.

[47] The author does not personally like the term "semi-chemical pulping," believing "chemical semi-pulping" is the more apt. All degrees of chemical pulping are still "chemical pulping" as opposed to mechanical pulping, while the product of "semi-chemical pulping" is a semi-pulped fiber.

(b) Changes Of Base:

Changes of base from calcium comprise the middle-ground, and again by purpose and intent they will not be extendedly dwelt upon.

The Calcium Base

The problems inherent in a recovery system for calcium base SWL have long been the object of overcoming, certainly long enough to have made the essential principles governing it clear.[48] The difficulties encountered in the evaporation of calcium base liquor in the conventional vacuum evaporator are out of reason in practicality. Extra-extraordinarily hard boiler feed water is distilled water in contrast.[49] Calcium base SWL has been evaporated to a combustible consistency on commercial-scale after a fashion, disregarding evaporative heat economy. But that does not complete the story: Furnace Problems are there; calcium does not smelt to the exploding kerplunk, kerplunk which is a familiar sound in a kraft mill; neither does it return the smelt chemicals in entire composition directly reusable for making acid cooking liquor since unavoidable furnace carbon reduction produces sulfides. By whatever practicable way evaporation and combustion be successfully attained, it will, of course, permit of satisfying "solution."

Change To Sodium Base

Change to sodium base sounds good; the pulp is of comparable yield and quality, the waste liquor is evaporable and combustible in conventional equipment. However, the smelt chemicals turn out to be those typical for sulfate pulping reuse and Footnote 50 applies, with the added disadvantage that sodium is a more costly chemical. It can permit of a satisfying "solution."

Change To Magnesium Base

Change to magnesium base can offer all-round bulk "disposal" and satisfying "solution," as well as SWL values recovery, both of heat and of directly reusable chemicals for cooking acid making. The pulp is of entirely comparable quality. The change is better applicable to the "big" and "medium fellows" though not at all denied to the "little fellow." Degree of obsolescence of the pulp mill and intent to modernize become weighable factors.[51] The existing well-known installation of the magnesium base system has been enough publicized not to call for extended description or comment here.

[48] The Worm's-Eye has acquired no pre-judged antipathy towards anyone's recovery system for calcium base SWL. All power and credit to them.

[49] To be sure, it too can be "softened." But with what? Say, with soda ash; precipitate out the calcium as carbonate. And there we arrive at that moth-eaten scheme which seems to have more lives than the nine of a cat, of using the then soda base liquor "for running the kraft mill." It needs only cursory inspection of the kraft black liquor cycle to see that the usable quantity of SWL would be limited to that equivalent to the salt cake make-up, a drop-in-the-bucket equivalent in a well run kraft mill.

[50] Except by a lugubrious, extracurricular process; to the pulp mill akin to teaming a Percheron horse with a Shetland pony.

[51] There is scant good sense in putting a brand-new silver-mounted saddle on a boneyard horse.

Change To Ammonia Base

Neither will change to ammonia base receive much comment. It exists in commercial-scale installations and elaboration of its possibilities would be anticipating disclosures of important ammonia base development in progress, likely to be publicized.[52] Ammonia base SWL can be practicably evaporated to combustible consistency and burned for riddance and heat return. Burned, not smelted, since no smelt results. The pulp is of comparable yield and quality.[53] The method can afford bulk and satisfying SWL "solution."[54]

Practical Base Changes Limited

Since calcium, sodium, magnesium and ammonia just about exhaust the practical possibilities of chemistry's Periodic Table of basic metals and the feasible alkalies to combine with sulfurous acid, they seem to comprise the here defined middle-ground field of SWL "disposal solution."[55]

[52] Ammonia base is the current godchild receiving SWL baptism.

[53] The Worm's-Eye may have a jaundiced view of ammonia base. Where a considerable money has to be spent anyway, it likes to see near-complete conservation all around; of wood solids and reuse inorganic chemicals. Moreover, ammonia is of the combined nitrogens invaluable in immense quantities as soils fertilizers and in innumerable chemical manufacturing processes; notably in all the ramifications of munitions of war and thus potentially vulnerable in great quantities for pulp-making.

[54] With ammonia base SWL, an ancient and wayside-weary by-product utilization might speculatively get a new and needed lift, namely as soils fertilizer, containing as it does combined nitrogen. While calcium base SWL contains fertilizing elements of lime, sulfur and "humus" —the lignin—it seems to deplete the soil of its nitrogen, assumed as due to the SWL-sugar digesting bacteria wanting it to perform.

[55] The author apologizes to any perchance reader for having taken up his time in the first place, being aware that he has contributed nothing new to the SWL "problem" picture, academically or practically; he guesses that maybe that is what is wrong with the stuff; there can't, it seems, be any thing of significant bulk "disposal" new about it.

Neither the alleged "pollutioner" nor the alleged "pollutionized," the former the sulfite pulp mills, the latter the public, is going to await newly found or belatedly developable bits-and-pieces of research to do the former's share of cleaning up those creeks, streams, rivers, bays and oceans labeled as musts. It has been from that view that the theme has been adhered to: "Disposal of SWL to 'solve the SWL problem.'"

If anyone had the audacity to do so and, say, 5,000,000 gallons daily of strong SWL to work with, the co-working of research, engineering, sales and capital could conceivably establish quite an impressive chemical manufacturing enterprise upon it—of multi-parts and parcels, to be sure, for its entirety of utilizing, like the meat processors, all of it but the squeal. It is not outside the bounds of reason that a group of pulp mills so contiguously located as to warrant transportation of their respective outputs of SWL to bring them into a whole to do just that, and having waded through not uncommon business troubles and worries arrive at ultimate success. Incidentally, there is a flaw, or flaws, in the general assumption that one gets SWL "for free" as a by-product raw material. So is water "for free." There are significant capital investment, operating and maintenance costs in collecting strong SWL, as little diluted as possible, from the pulp and delivering it to the by-products plant.

The Worm's-Eye View has been assumed because it dislikes calcium base SWL in any way, shape or manner; in fact, to get a proper View of it, it has to look downward and underward. Remarks which may seem to be of facetious nature have not been meant to be so.

Claflin Refiners, used for preliminary treatment of the hot stock from the blow tank.

St. Joe Increases Pulp Yield By Hot Stock Refining

C. E. Wright

In an effort to increase its pulp yield, the St. Joe Paper Co., Port St. Joe, Fla., has been engaged since March, 1949, in the working out of a new refining process for hot stock. Until recently the new process had been conducted on an experimental basis, but since then on an operational basis at its plant at Port St. Joe, on the northwest coast of Florida.

Sharp increases in pulp yield ranging as high as 25 percent, and seldom below 20 percent have been obtained. This new high yield sulphate process was originally developed by Sutherland Refiner Corp. in conjunction with Bathurst Paper & Power Co. It has now been operating for an entire year at St. Joe producing an average of more than 400 tons of pulp a day so that the results have been definitely established in a full plant operation.

During the experimental period of operation various combinations of methods were tried one at a time, each one being carefully checked for a month.

The system used to produce this high yield utilizes four 4300 cu. ft. digesters. From the digester the stock is blown to a conventional blow tank. Leaving the blow tank, the pulp is pumped over magnets for tramp metal removal, then to two Claflin refiners to break up the over-size chips which might clog control valves. These Claflin refiners also stop any metal, which might have gotten by the magnets, from getting through to the disc refiners.

After passing through the Claflins the stock is processed by four Sutherland 48 in. disc refiners and then enters the normal mill operations of washing and screening prior to further processing.

The higher yield pulps are produced by cooking at lower temperatures with reduced amounts of alkali. This milder treatment retains higher percentages of both lignin and carbohydrates but leaves the chips undefibered when blown thus making it necessary to use mechanical defibration.

At present the digesters are producing 16.5 tons of finished products per blow. Wood consumption is 1.5 cords per ton of board produced. The digester is charged with 11,300 gal. total of both black and white liquor of which 7400 lbs. is active alkali. Digesters are cooked for 1¾ hours and use 36,300 lbs. of steam at a maximum digester pressure of 98 lbs. per sq. in.

The defibering of the high yield pulp has increased the power requirement of the pulp mill by approximately 2.5 hp. tons per day.

Permanganate number run in the mill prior to high yield averaged from

Sutherland 48 inch Refiner, used for treating hot stock from the blow tank.

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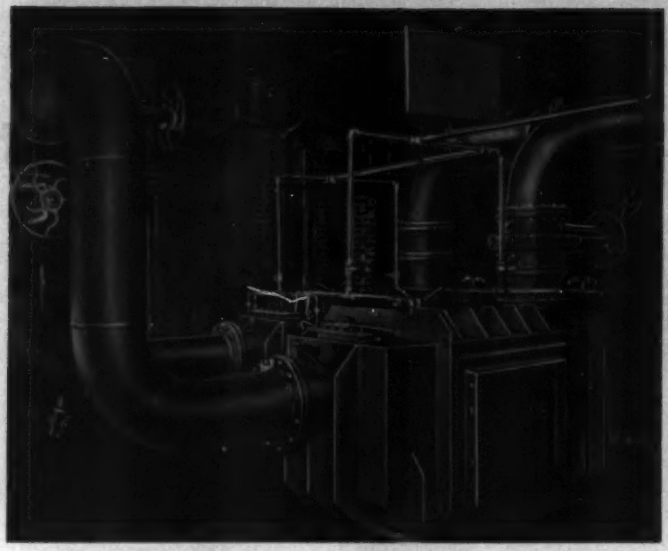

Dings magnet used for removing tramp iron from the stock before refining.

30-34 TAPPI. Today the permanganate is 44-46 TAPPI. Owing to the fact that the sensitivity of permanganate tests is questionable in this extremely high range, chlorine numbers are being run to determine their reliability. So far chlorine numbers of 15.2 to 16 have been recorded.

"Although the operation of this system has resulted in a very substantial increase in yield, it is felt that still additional yield can be gained," says Harry H. Saunders, production manager. "The limitation in yield at present is ability of the existing washing system to carry the load. To overcome this, another line of pressure washers is being added. This will increase the washing capacity by 300 tons a day. As soon as this system is in operation, work will be started to further increase the yields. Sufficient information has already been gathered to establish the value of the system as a means of lowering costs, conserving natural resources, and at the same time produce a product which is up to required standards in all respects."

The savings in pulp wood will be about 3750 carloads a year, based on a 25 percent increase in yield, which is considered to be an important addition to the programs that are being carried out for protection and reforestation of existing timber lands. The St. Joe Paper Co. has upward of 500,000 acres of timberland, most of it in the northwestern part of Florida contiguous to the mill. Its Woodlands division has a well-organized staff of forest rangers, with headquarters at Hosford, west of Tallahassee.

The Port St. Joe mill, at maximum capacity, produces 12,000 tons of pulp a month, a large part of which is utilized for the company's container division adjoining the pulp mill, and the remainder is sold elsewhere.

The mill is managed by Harry H. Saunders, production manager, and Earl L. Hobaugh, mill superintendent, under the direction of Edward Ball, president of the company, and W. T. Edwards, vice-president in charge of operations. It was built in 1938 at a time when that area of northwestern Florida was still largely a wilderness and virtually without good roads. Its site was selected because of the advantage of a deep-water harbor and an abundant surrounding supply of Florida pine, which, though it has been gradually thinned out, is being replanted for the future.

Harry H. Saunders is a native of West Virginia. He moved to St. Augustine in 1918 and served as a member of the Florida Legislature from St. Johns County in 1935 and 1937. He joined the Du Pont interests and went to Port St. Joe in 1936, one year before construction work was started on the mill. He served as office manager until 1940, when he was appointed production manager.

Earl L. Hobaugh, mill superintendent, went to Port St. Joe in 1944 after a long experience in pulp and paper manufacturing with International Paper Co., Niagara Falls, N. Y.; the Minnesota & Ontario Paper Mill, International Falls, Minn.; Crossett Paper Mills, Crossett, Ark.; and the Union Bag & Paper Corp., Savannah, Ga.

Foreign Literature Abstracts

"Paperi ja puu. Papper och Tra" December, 1950

STRUCTURE OF CELLULOSE FIBRES, by Bjarne Andvord Tonnesen, Chemical Engineer, Papirindustriens Forskningsinstitutt, Oslo, Norway.

Presented before annual meeting of The Finnish Paper Engineers' Assn. on April 22, 1950.

"In the form of a paper read, based on recent literature, a survey is given as to some aspects of morphological and physical structures of cellulose fibres.

"Light microscopy studies by Haas, electron microscopy studies by Preston, by Kinsinger and Hock, by Mühlethaler, and by others, are considered. The concept of the 200–300 A microfibril already early suggested by Frey-Wyssling is discussed.

"As concerns x-ray investigation, some of the classic results obtained on the basis of x-ray crystallographic methods are reviewed.

"An account is also given of the possibility of using an x-ray diffraction method commonly applied to structure determination of liquids, to elucidate the molecular structure of the cellulose chain in unoriented samples of regenerated (viscose) cellulose. This possibility is utilized by the author of the present paper and coworkers, in a work not yet completed. Two »radial distribution functions», giving information as to interatomic distances in the samples in the range below 15 A, are shown. The correlation to be found at the present time between these curves and chain structure possibilities are indicated."

THE ALDEHYDE FORMATION AND THE ALCOHOL YIELD AT THE FERMENTATION OF SULPHITE WASTE LIQUOR, by Jacobus Sundman, head of Biological Department, and Veronica Sundman, B. Sc. Biological Department, Oy Keskuslaboratorio — Centrallaboratorium Ab (The Research and Testing Institute of the

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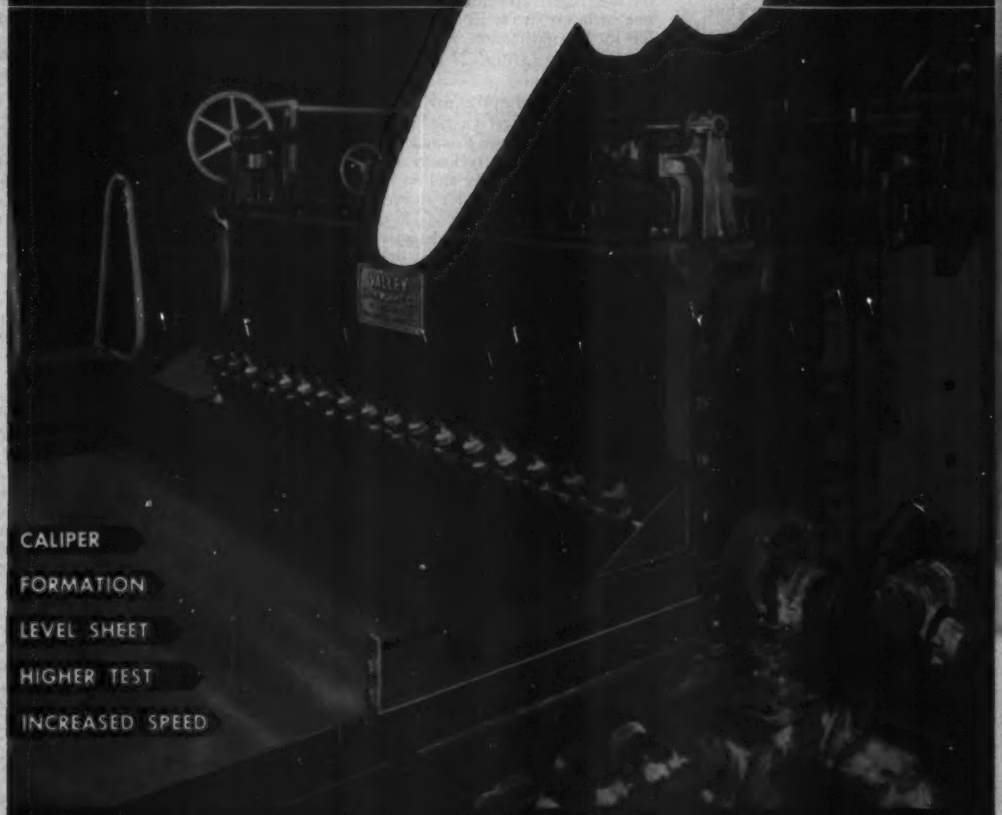

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VALLEY IRON WORKS CO., Appleton, Wisconsin

Finnish Pulp and Paper Industries, Helsinki-Helsingfors, Finland).

"When manufacturing alcohol from sulphite waste liquor it is a well-known fact that a considerable amount of acetaldehyde accumulates in fermentation. It is generally never utilized but brought back to the fermentation vessels with the so-called fordrops. As the alcohol yield considerably decreases owing to this acetaldehyde formation, we have in various ways tried to diminish it. We found, however, that any change of temperature, acidity or yeast concentration was of no avail. On the other hand about 4 percent more alcohol could be obtained provided the fordrops were added at the very beginning of the fermentation process and not continuously during the course of fermentation. The test also showed that more fordrops than the average amount should be added if the waste liquor contained an exceptional amount of bisulphite, while on the other hand it would be advisable to store fordrops for future use when the bisulphite percentage is below the average."

QUESTIONS OF PROVENANCE WITH RELATION TO PULPWOOD

by Count Albrecht Friedrich v.d. Schulenburg, Bundesinstitut fur Forst und Holzwirtschaft, Hamburg, Schloss Reinbek.

Paper read before the Society of Forestry in Finland, Helsinki, on October 25, 1950.

"Picea abies, the spruce, is number 1 among the pulpwood trees in Europe, and therefore it is very important to produce more of it. But how? One of the few possibilities is to improve the growth of the spruce, to make it produce the highest quality of timber in the shortest possible time. This question is of vital interest now more than ever. Accordingly those experiences, which proved that climatic races of spruce from the mountaneous regions of Central Germany brought to North Europe surpassed the growth of the local spruce, are very striking. This result may be explained by the fact that the spruces of the short-day summers brought to the long-day summers can daily assimilate a few hours longer and consequently produce more wood. However, there is one disadvantage: these mountain spruces from Central Germany (Harz, Thüringen, Schwarzwald, etc.) will awaken from their winter sleep too early in Spring. They put forth their light-green shoots too early and fall a victim of the late night frosts and this repeats year by year. The consequence: losses in growth, often also crooked growth. In 1926 the author discovered a small ancient reserve area growing lowland spruces of very good quality. In addition, they endured the late frosts well, mainly because of late shooting. Each seed year the author organized a collection of the seed from the standing trees and reproduced this spruce at his own estate. With the 2nd World War both the reserve area and the large young plantations were destroyed, but fortunately in 1936 he had sent some of the original seed to the Danish State Forest Experimental Service and those plantations were safe. These trees are, however, too young to bear seed in the near future, but later on steps have been taken in Sweden and Western Germany for propagation of same by other methods.

"Where common spruce was regenerated on loamy and marly soils it soon became obvious that it was susceptible to red rot attacks, especially in the quick growing early stages of the tree. More endurable proved to be the American lodgepole pine (Pinus Murrayana), which also grew faster on such soils. According to the latest nomenclature of the U. S. Forest Service its botanical name is: Pinus contorta latifolia (syn. P. Murrayana Balfour).

"Large silvicultural experiments with this pine were first carried out on a large scale in South Finland at Mustila. On fresh, lightly loamy soil this species grew splendidly and an investigation made 33 years later showed that P. Murrayana had produced 320 m^3 per hectar while adjacent Pinus sylvestris gave 207 m^3 and Picea abies only 160 m^3 per hectar. In this particular case seed from North West Canada was used. The most important things in trying to reach the maximum productivity of P. Murrayana are:

"a) Strict observance of the origin of the seed to be used. The local climate of the regeneration area must correspond to that of the seed collection area in North West America.

"b) Good and fresh, even to humid broad-leaved soils, grass-type. To be avoided: acid podsols, dry sands or swampy sites.

"c) Lodgepolepine shall not be planted in dense monocultures, but at large spacing with an admixture of one-half to two-thirds of other tree species. Usable as such: Picea sitchaensis, Picea abies, etc., rather, however, broad-leaved trees such as Alnus incana and Alnus glutinosa."

STUDY ALKALINE CORROSION

Technical cooperation that crosses international boundaries and is supported by competitive companies, was described on March 13 by Lincoln R. Thiesmeyer, Ph.D., speaking to a joint meeting of Canadian and American pulp and paper men in the Queensway Hotel.

Dr. Thiesmeyer, who at one time was associated with atomic research, is head of the Pulp and Paper Research Institute at Montreal. He was addressing a joint meeting of the Niagara Branch of the Canadian Pulp and Paper Assn. and the Empire State Branch of the Technical Assn. of the Pulp and Paper Industry.

Twelve companies are cooperating in one $170,000 project to find out how to prevent alkaline corrosion of pulp and paper machines, he said. Free access has been granted the Institute to information collected by the United States group of pulp researchers, and another Canadian group at Appleton, studying the same problem is providing information.

A "task force" of three specialists will live at each of the paper mills with a corrosion problem for one or two weeks.

The mass of detailed information will be coded and put on punch cards. A U. S. nickel company has offered the use of its specialized business machines to sort the coded information and discover trends in the mass of information.

Save Sulphur

Another project now under way gives promise of a possible saving of 72 percent of the sulphur used in paper making. Dr. Thiesmeyer said. If the project proves successful on the commercial level, it would have far-reaching effects in eliminating the present shortage of sulphur, declared the speaker.

"There is nothing certain yet," he said, "but results so far have been so challenging that we must follow it to the end."

A pilot plant is available for a large-scale test, and results this year should show whether the 72 percent saving can actually be made.

Sulphur is used extensively in paper making, and much of it is lost at the end of the process, and runs off as waste material. Purpose of the present experiment is to devise a means of extracting useable sulphur from the liquid waste.

Sulphur may be saved in other ways, for instance in the cooking of the paper, said Dr. Thiesmeyer. A report of saving methods will be issued soon.

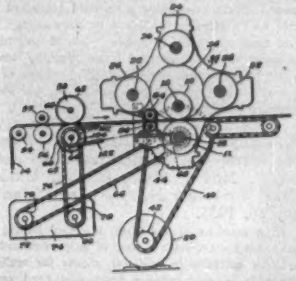
A. P. Jewett, of Provincial Paper Co., introduced Dr. Thiesmeyer, and the speaker was thanked by L. C. Anderson of the Ontario Paper Co. Mr. Anderson declared that the benefits of the research being carried on by Dr. Thiesmeyer's agency would spread all over North America.

Steven G. Stapley, chairman of the Niagara Branch of the Canadian Pulp and Paper Assn., welcomed the United States visitors to the meeting. Leader of the U. S. group was Irving Earle, chairman of the Western New York District of the Empire State Branch.

Patent Abstracts

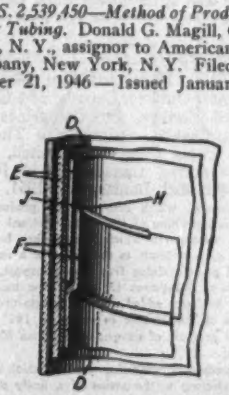
● *In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information are included.*

U.S. 2,539,379—Rotary Cutting Machine. William R. Wright, Dedham, Mass., assignor to Bird & Son, Inc., East Walpole, Mass. Filed November 20, 1948—Issued January 23, 1951.



For supplying strip roofing material in a fully controlled taut condition at the cutting plane of the rotary cutter, the combination with a rotary cutter having cooperating anvil and cutter rollers, of a strip material feed mechanism which comprises a pair of feed rollers arranged for feeding the strip material to the rotary cutter, a pair of auxiliary slip feed rollers of a diameter substantially less than the diameter of said feed, anvil and cutter rollers and thereby adapted to engage the feeding strip material in close proximity to the cutting plane of the rotary cutter, means for supporting the auxiliary feed rollers between the feed rollers and rotary cutter in close proximity to the cutting plane of the rotary cutter, power driving connections for driving the rotary cutter and feed rollers at related linear rates, and connections for driving the auxiliary feed rollers at a faster rate than the feed rollers.

U.S. 2,539,450—Method of Producing Fiber Tubing. Donald G. Magill, Great Neck, N. Y., assignor to American Can Company, New York, N. Y. Filed November 21, 1946—Issued January 30, 1951.



A method of producing fibre tubing from which containers are made, which comprises winding under pressure upon a tube forming mandrel a plurality of layers of sheet material one over the other with an adhesive between the layers for bonding them together while overlapping and securing the edge portions of the inner layer to produce a tight inside seam, sufficient adhesive being present between said overlapping edge portions to cause extrusion of said adhesive when said layers are wound upon each other under pressure, and prior to said winding step, applying a fluid treating material to said edge portions on the adhesive coated surface of said inner layers of sheet material to nullify the adhesiveness of said adhesive extruded past said edge portions at said inside seam during said winding step and thereby prevent adhesion of the tubing to the mandrel.

U.S. 2,539,451—Method of Preparing Sulfuric Acid Esters of Cellulose. Carl J. Malm and Carlton L. Crane, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N.Y. Filed February 27, 1948—Issued January 30, 1951.

A method of preparing cellulose sulfate which comprises forming, and mixing cellulose therewith, at a temperature of 25-60° F., a bath comprising isopropyl alcohol, concentrated sulfuric acid, ammonium sulfate in an amount less than 8% of the bath and not more than 10% of water, the isopropyl alcohol-sulfuric acid consisting of 15-25% of isopropyl alcohol and 85-75% of sulphuric acid, the cellulose being present in the proportion of one part of cellulose to 12-60 parts of liquid, and the ratio of alcohol-sulfuric acid to cellulose in the mass being 4-30:1, and continuing to maintain the temperature at 25-60° F. until the cellulose has been converted to a cellulose sulfate.

U.S. 2,539,513 — Method of Packaging. Henry Jenett, Montclair, N. J.; Caroline Louise Maria Jenett, executrix of the estate of said Henry Jenett, deceased. Filed July 20, 1946—Issued January 30, 1951.

A method of packaging articles which comprises holding the article by a support of small surface area in contact with the article, applying to the article and a portion of the support a coating of a fluid composition which yields a solid strippable thermoplastic film on the article after the lapse of a short period of time following a cessation in the application of the coating composition, stripping the thermoplastic film from the support to form a sleeve, and sealing the sleeve to form a tab.

U.S. 2,539,558 — Permanent Paper and Method of Making Same. John Studeny, Erie, Pa., John D. Pollard, Baltimore, Md., and Chester G. Landes, New Canaan, Conn., assignors to American Cyanamid Company, New York, N. Y. Filed September 28, 1948—Issued January 30, 1951.

A method of improving the stability of paper against aging which comprises impregnating said paper with an aqueous solution of a compound of the formula

$$\begin{matrix} & & \text{NH} & & \\ & & \| & & \\ \text{R.NH.C.NH.CN.} & & & & \end{matrix}$$

in which R is a member of the group consisting of hydrogen and alkyl and hydroxyalkyl radicals of 1 to 4 carbon atoms and subsequently drying the paper to retain therein about 0.3% to 10% of said water-soluble compounds in monomeric condition.

U.S. 2,539,586—Preparation of Cellulose Esters. Mervin E. Martin, Troy M. Andrews, and Albert R. Franck, Cumberland, Md., assignors to Celanese Corporation of America, New York, N. Y. Filed August 20, 1949—Issued January 30, 1951.

In a process for ripening organic acid esters of cellulose prepared by the esterification of a cellulosic material with an organic acid anhydride in the presence of sulfuric acid and an organic acid solvent for the ester being formed, the steps which comprise adjusting the concentration of free sulfuric acid in the esterification solution to from 1.5 to 2.5% by weight on the weight of the cellulosic material, raising the temperature of the esterification solution to from 55 to 60° C. for a period of from 20 to 40 minutes, adjusting the concentration of free sulfuric acid in the esterification solution to from 0.7 to 0.9% by weight on the weight of the cellulosic material, raising the temperature of the esterification solution to from 82 to 87° C., and holding the esterification solution at from 82 to 87° C. until the organic acid ester of cellulose has the desired acyl value.

U.S. 2,539,745—Apparatus for Coiling and Cutting a Continuously Moving Web. Frank J. Keller, Cleveland, Ohio, assignor to Wean Equipment Corporation, Cleveland, Ohio. Filed July 17, 1947—Issued January 30, 1951.

Apparatus for coiling and cutting a continuously moving web comprising a frame, two sets of bending rolls journaled therein, a deflector for directing the web toward one or the other of said sets, and a pair of shear blades extending along the deflector adjacent thereto and movable across the path of the web to sever it and carry the severed leading edge of the web from one side of the deflector to the other.

U.S. 2,539,975—Process for Improving the Drying Qualities of Tall Oil. William C. Spitzer, Chicago, Ill., and Russell T. Ryan, Hammond, Ind., assignors to The Sherwin-Williams Company, Cleveland, Ohio. Filed October 14, 1948—Issued January 30, 1951.

A process for the manufacture of a varnish vehicle which comprises heating an oil-like unsaturate selected from the group consisting of crude tall oil acids and the polyhydric alcohol esters thereof, to a temperature within the range of from 200 degrees C. to 300 degrees C., vigorously blowing an oxygen liberating gas therethrough and maintaining said reaction condition thereafter for from 2 to 8 hours.

U.S. 2,539,990 — Expansive Fiber Separator. Robert S. Chapman and Byron B. Siebenhaar, Phoenix, Ariz. Filed November 14, 1946—Issued January 30, 1951.

A cylindrical pressure vessel for extracting fiber from fiber bearing plants by the explosion process including, in combination, a cylindrical pressure vessel having an open breech, and a constricted muzzle orifice; means for introducing steam under pressure into said cylindrical pressure vessel; means for indicating the pressure within said cylindrical pressure vessel, a breech door hinged to open and close over said breech; means for sealing said breech door when in closed position, including a breech door cylinder formed therein, a piston operative in said breech door cylinder having a sealing surface adjacent the rim of said breech, and means for introducing hydraulic fluid under pressure into said breech door cylinder; a muzzle closing valve door adapted to close and seal said cylindrical pressure vessel muzzle and supported by hinge struc-

ture to said cylindrical pressure vessel; means for operating said muzzle closing valve door from open to closed position including a motor, operative closing elements, and means for reversing said motor and moving said elements to inoperative position whereby said door is free to open; mechanism for sealing said valve door in closed position including a sear on said door, a thimble roller supported on linkage operated by a hydraulic sealing cylinder adapted to engage over said sear and draw said door against said muzzle orifice; means for releasing said door including a hydraulic releasing cylinder having a piston rod adapted to move said thimble from engagement with said sear; and means for retarding and stopping opening movement of said muzzle valve door including a hydraulic dash pot cylinder having a piston rod connected by mechanical gain linkage to said door hinge structure, a piston loosely operating in said dash pot cylinder, said dash pot cylinder having portions of its bore formed with diminishing diameter whereby its piston is progressively retarded by greater resistance as it moves from its position when the said door is closed to its position with said door opened.

Can. 470,576—Paper Making Apparatus. Allen A. Lowe, Glens Falls, New York, U.S.A., assignor to The Sandy Hill Iron & Brass Works, Hudson Falls, New York, U.S.A. Filed September 8, 1948—Issued January 2, 1951.

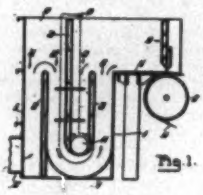


Fig. 1.

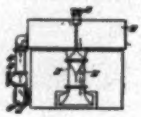


Fig. 2.

Paper making flow box apparatus comprising in combination, outer bottom, front, rear and side walls forming a flow box and a front horizontal wall and slice thereabove, vertical walls spaced from one another and from said front and rear walls forming with said side walls vertical delivery and a separate overflow passageways, certain of said outer walls provided with an inlet and overflow outlet, said passageways arranged whereby stock may flow from said inlet through said delivery passageways and beneath said slice and excess stock may flow through said overflow passagway.

Paper making flow box apparatus comprising in cobbination, outer bottom, front, rear and side walls forming a flow box and a front horizontal wall and slice thereabove, vertical walls spaced from one another and from said front and rear walls forming with said side walls vertical delivery and a separate overflow passageways, certain of said outer walls provided with an inlet and overflow outlet, said passageways arranged whereby stock may flow from said inlet through said delivery passageways and beneath said slice and excess stock may flow through said overflow passageway, a stock receptacle for receiving stock having a connection to said inlet, and means for conveying excess stock from said outlet to said receptacle.

Can. 470,687—Apparatus for Operating Molded Fibre Drying Dies. Merle P. Chaplin, South Portland, Maine, U.S.A., assignor to Chaplin Corporation, South Portland, Maine, U.S.A. Filed September 10, 1949—Issued January 9, 1951.

In a machine for drying molded pulp articles wherein the upper and lower dies of a die couple are orbitally rotated about a fixed vertical axis with the dies of such couple in mating relation for an angular portion of such rotation and with the lower die withdrawn downwardly from the upper die for the remainder of such rotation, the improvement which comprises: a lifting elevator situated in a fixed position at the point in the orbit of rotation of the lower die where the latter is to be raised into mating relation with the upper die to there receive the lower die and elevate it into such mating relation, a lowering elevator situated in a fixed position at the point in the orbit of rotation of the lower die where the latter is to be withdrawn downwardly to there receive such lower die and lower it, guides for guiding each of such elevators for up and down movement, and means for raising and lowering said elevators.

Can. 470,725—Repression of Chlorine Dioxide Generation from Acidified Chlorite Solutions. Royden N. Aston, Niagara Falls, New York, U.S.A., assignor to The Mathieson Alkali Works, New York, New York, U.S.A. Filed November 25, 1947—Issued January 9, 1951.

The method of repressing the generation of chlorine dioxide in an aqueous chlorite solution maintained at a pH between 7 and about 3 which comprises including in the solution a phosphate of the group consisting of the water soluble pyrophosphates and polyphosphates.

The method of repressing the generation of chlorine dioxide in an aqueous chlorite solution maintained at a pH between 7 and about 3 which comprises including in the solution hydrogen peroxide and a phosphate of the group consisting of the water-soluble pyrophosphates and polyphosphates, the phosphate to peroxide ratio being within the range 0.1:1 to 8:1 and the total concentration of the phosphate and peroxide not exceeding 75 grams per liter.

The method of claim 3 as practiced with sodium tetraphosphate.

The method of repressing the generation of chlorine dioxide in an aqueous chlorite solution maintained at a pH between 7 and about 3 which comprises including in the solution synergistic proportions of hydrogen peroxide and a phosphate of the group consisting of the water-soluble pyrophosphates and polyphosphates.

Can. 470,726 — Electrolytic Apparatus. William C. Gardiner, Niagara Falls, New York, U.S.A., assignor to Mathieson Chemical Corporation, New York, New York, U.S.A. Filed August 24, 1948—Issued January 9, 1951.

Apparatus for the electrolytic decomposition of alkali metal compounds in solution which comprises in combination a mercury cell having an inlet end and an outlet end, an amalgam decomposer, a pump, conduit connecting the decomposer, pump and outlet end of the cell for pumping the amalgam into the decomposer at an elevation above the solution level in the cell, and a conduit located at least in part under the cell connecting the decomposer with the inlet end of the cell through which the mercury released in the decomposer is forced by weight of the liquids in the decomposer to flow into the cell.

Can. 470,763—Target Operated Taping Machines. Charles Hess, Yonkers, New York, U.S.A., assignor to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, New York, U.S.A. Filed October 8, 1948—Issued January 9, 1951.

In a taping machine for applying tape to the seam of a folded box blank, means for moving the box blank through the machine, a tape supply, tape feeding and supply apparatus for applying the leading edge of the tape to the leading edge of the seam, tape cutting apparatus for cutting the tape after a length thereof equal to the length of the seam has been drawn from the tape feeding and supply apparatus; said tape feeding and supply apparatus and said tape cutting apparatus being electrically controlled; said tape feeding and supply apparatus comprising a feed roller biased for rotation in a feeding direction; said electrical control means comprising a solenoid connected to said feed roller and arranged to store energy in said feed roller biasing means when the solenoid is energized; said solenoid being normally energized; switch means operable by the passage of a box through the machine to de-energise and then energize the solenoid.

Can. 470,794—Cylinder Type Paper Machines. Roy H. Breyfogle and Robert F. Hollis, Alton, Illinois, U.S.A. Filed November 24, 1947—Issued January 16, 1951.

In a machine of the class described having a stock vat for receiving a pond of pulp stock and a cylinder rotatable in said vat, means for sealing the ends of said cylinder from said pond comprising a ring composed of a plurality of successive adjacent resilient seal units carried by and projecting endwise from each end of said cylinder and bearing endwise against coacting surfaces formed on walls of said vat.

In a machine of the class described having a stock vat including oppositely disposed walls, and a cylinder rotatable in said vat with the ends of said cylinder being adjacent opposite walls of said vat, means for sealing the ends of said cylinder from said pond comprising a ring formed by a plurality of adjacent resilient seal units arranged concentric with each end of said cylinder, said seal units being attached to said cylinder and projecting endwise therefrom, a wear plate ring mounted on each of said vat walls in extension of the seal units at each end of said cylinder, said seal units being abutted endwise against said wear plate rings, and a localized shallow depression in each wear plate ring to permit flexing of said resilient sealing units as the cylinder rotates while maintaining contact between the wear plate rings and seals.

Can. 470,915—Methods of Producing Vanillin. Harry Borden Marshall, Toronto, Ontario, Canada, and Charles Alfred Sankey, St. Catharines, Ontario, Canada, assignors to The Ontario Paper Company, Limited, Thorold, Ontario, Canada. Filed July 9, 1945—Issued January 16, 1951.

A catalyst which assists in the production of vanillin consisting of the sludge residual in a reaction mixture in which vanillin has been produced by subjecting, to the action of a finely dispersed gas containing free gaseous oxygen, lignin-containing substances in an alkaline medium to which has been added copper sulphate under conditions of temperature in excess of 140° C. and partial pressure of oxygen of less than 20 lb. per sq. in.

A method of producing vanillin which consistst in subjecting to the action of a finely dispersed gas containing free gaseous oxygen a reaction mixture comprising lignin-containing substances in an alkaline medium to which has been added copper sulphate, separating the residual sludge therefrom, adding said sludge to a reaction mixture containing lignin-containing substances in an alkaline medium and subjecting such combined materials to the action of a finely dispersed gas containing free gaseous oxygen.

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Abstracts of Papers Presented Before Commercial Chemical Development Assn.

Annual Meeting, New York City, March 21, 1951

Chemicals and Plastics—Probable Effects of Regulations

F. H. Carman
Asst. Sec., Mfg. Chemists' Assn., Inc.

The public and many industrial experts not conversant with the chemicals and plastics industry have been prone to look upon plastics as readily available substitutes. However, in many instances plastic materials are in shorter supply than steel or aluminum today. No substantial expansion can be undertaken by the plastics industry without provision for basic chemicals, many of which are in short supply, such as benzol, chlorine, methanol, glycerine and phenol. The relatively low production capacity for plastics as compared with that of metals shows that substantial replacement by plastics merely for the sake of substitution could make little saving in metals consumption.

Plastics generally should not be regarded as substitutes, but as basic engineering materials supplementing wood, metal, fabrics, etc. In many cases they are superior to other materials allowing a broader choice of manufacturing processes; conversely, they make poor substitutes if improperly used.

Generally, the chemicals and plastics required for direct war products are available in sufficient amounts to easily take care of the defense program and a fair percentage of the essential civilian requirements. Barring any major dislocation, there should not be any great change in the distribution pattern of basic chemicals to plastics manufacture and in the chemical industry in general. The problem will be to continue an equitable distribution of the civilian portion.

The present emergency and the status the chemical industry has attained in the last five years, provide a golden opportunity for sound development of new products never before presented this industry in such magnitude. Those concerned with commercial chemical development will find it necessary to trace the many ramifications of end use changes back through the various intermediates and basic chemicals in order to arrive at the best economic use of the basic materials and manufacturing facilities.

The Making of a Manager

1951 Honor Award Address

Francis J. Curtis
Vice-President, Monsanto Chemical Co.

Instead of allowing men's careers to proceed in a haphazard manner, they must be designed so as to give as high a yield of finished product from the overall potential candidates as we can obtain with the best of our efforts. We need many managers in all grades and we will need more as the complexity of life grows. The setting up and the handling of a managerial development program requires someone with warm understanding and sympathy. The supreme characteristic of a good manager is good judgment of men.

Choosing the raw material is the weakest link in our program, the most difficult to carry out with high efficiency. The solution of the problem is to depend on the human judgment of seasoned interviewers. In picking candidates for special managerial development, choice by one or two skilled individuals, aided by reports and recommendations from others, is favored over the use of committees. The candidate should not be told he is being groomed for executive development because if he then fails, the fall is greater.

Any system of executive development must have extreme flexibility. The overseers of the program should be a group of advisors of managerial stature, each of whom will take over personal contact with a few of the candidates. Three or four years of successful experience in at least two departments of the company is essential in the making of a good manager. His progress is measured by periodic interviews by his advisor and occasionally by the program head. Candidates should be encouraged to study outside their field of specialization. A manager cannot have enough practice in leadership and candidates should therefore participate in outside activities where they can find opportunities for such practice.

We should focus on the need for the making of managers by a process and a program which is conscious rather than depend on the unwitting forces of chance. It is a subject which must be approached with human understanding, sympathy, and interest where feeling plays as much of a part as science.

What's Ahead in Labor, Capital and Materials—Government Controls and the Business Outlook

Wesley Lindow
Vice-President and Economist, Irving Trust Co.

This paper reviews the economic situation with special reference to the effects of government controls. The first part considers what's ahead in raw materials, capital, and manpower. The second part presents brief comments on the general economic outlook in 1951 and beyond.

Materials: I believe that the general shortage of raw materials has been the single most important inflationary factor since the Korean war began. Throughout the economic structure shortages and fears of shortages have been the most important economic fact of life in the last 9 months. These fears have been largely stimulated by expectations with regard to the defense program but they were also made more serious by the fact that there has been a long-run tendency for raw material capacity to lag behind finished goods capacity.

I believe that the government has 3 major functions in the field of raw materials: The first function is to take every possible means to enlarge available supplies. The second is to undertake a continuous review of the military program and stock-piling programs to make them fit the realities of the supply situation. The third function is to allocate the remaining limited supplies to civilian users on some sensible basis.

The problem of raw material shortages is likely to be with us for some time, although it may turn out that the next year or so will be the year of the worst pinch. The pinch has been surprisingly slow in coming largely because we were living off accumu-

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UFORMITE 467 (anionic type) provides efficient, low-cost wet-strength in unbleached Kraft, bag stock, and similar furnishes. Particularly suitable for beater addition.

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CHEMICALS FOR INDUSTRY

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lated stocks to a considerable extent. Now we must learn to live within our current production and imports. A year from now our resources will be greater and some large increases in capacity of raw materials will be in sight.

Capital: Business investment in plant and equipment will probably hit a new high this year under the national policy of encouraging expansion of productive facilities. A major question is whether business will have the financial resources to do the job required in this emergency period. The answer to this question involves a great many factors including corporate profits, corporation taxation, and government policies on several matters. The government will affect business finance directly in many ways, such as: (1) government purchase contracts to buy the total output of a new or expanded plant, (2) prepayments on government contracts, (3) direct government financing, (4) government guarantees of loans, (5) renegotiation of profits, (6) certificates of necessity, and (7) new corporate taxation.

Generally speaking, corporate capital problems are not likely to be severe in the present emergency period. Corporations are probably going to be able to finance a large part of their outlays from internal operating funds, including both undistributed profits and current depreciation allowances. My estimates indicate that in 1951 these internal funds will probably provide better than ⅔ of the corporate requirements for funds.

Manpower: A manpower shortage is in the offing, but I do not view it with the same degree of seriousness as the raw materials bottleneck. The worst pinch will be in certain classes of skilled labor. Government programs to direct the use of manpower to some extent will emerge as time passes, but right now these are embroiled in the fight between organized labor and the Office of Defense Mobilization.

Business Outlook: The year 1951 is going to be a year of transition. The military program is steadily inexorably growing day by day and month by month. Up to now cut-backs in civilian production have been less harsh than many people expected. The warehouses are bulging with inventories in many lines. Some people are beginning to talk about an impending weakness in the business picture because of excessive inventories. For my part, I would discount these difficulties. This is the lull before the storm. By the third quarter of this year military contracts will be flowing at an accelerated pace, and civilian cut-backs will become painfully larger. I believe that the talk of inventory weakness will quickly fade.

Now let's look beyond 1951. If we can avoid all-out war, and I think our present programs are in the right direction to accomplish this, then we may have to look forward to a military program of $50 to $60 billion a year for several years. Meanwhile, our productive capacity will continue to grow for we have an enormous facility for economic growth. As we grow we can carry a large military program with less and less strain. Some of the controls can be dropped from time to time. The burden of taxes can be lessened as national income rises.

Our productive machine is likely to provide the answer to the inflation problem as time passes. We shall probably be able to carry with whatever military program is necessary and without indefinite inflationary pressures once we get over the hump.

Moreover, as we build up our military and productive strength, we may also be able to let the military program taper off. I wouldn't want to relax our awareness of the Russian problem for one minute, but I think our confidence is bound to grow importantly. I am hopeful that we have already passed the darkest moments of the Russian threat. Even if I am wrong, I reiterate that we can carry a large military program with less and less strain as time passes.

Organizing Your Business for Coordination with Government

John L. Burns
Senior Partner, Booz, Allen and Hamilton

In organizing your business for coordination with the government there are two major objectives, (1) to help the government establish practical regulations, and (2) to comply with the established regulations with the minimum of disturbance to sound business practices. Steps which should be taken toward achieving these objectives are:

(1) Designate a key executive to be responsible for government regulations and for compliance with government laws and regulations.

(2) Thoroughly study present mobilization laws and regulations that pertain to your particular industry.

(3) After considering the effect of these laws and regulations, review them again from a national point of view.

(4) Define the problems of your industry under these laws and regulations and develop answers to these problems in written form.

(5) Determine the channel through which we can be most effective in working with the government.

(6) Direct the answers to your industry's problems through this channel to the working level of the appropriate agency.

(7) When you receive from the government requests for information that appear to be unnecessary, write to the Advisory Council on Federal Reports, 1615 H Street, N. W., Washington, D. C., and explain your reasons. This is a private organization sponsored by the U. S. Chamber of Commerce and other business organizations.

We can help greatly in maintaining the American Way of Business by organizing so that we can help the government establish practical regulations, and so that we can comply with the established regulations with a minimum of disturbance to sound business practices.

New Officers

At the annual business meeting on March 20 the following new officers were announced, to take office July 1, 1951: President, Victor E. Wellman, Calco Chemical Div., American Cyanamid Co.; vice-president, Charles W. Walton, Minnesota Mining & Mfg. Co.; treasurer, Nolan B. Sommer, Jefferson Chemical Co., Inc.; executive secretary, Gordon O. Cragwall, Chas. Pfizer & Co., Inc. Directors, R. L. Bateman, Carbide & Carbon Chemicals Div., Union Carbide & Carbon Corp.; James H. Boyd, consulting chemical engineer; Lawrence Flett, National Aniline Div., Allied Chemical & Dye Corp.; John T. Ragsdale, Jr., Monsanto Chemical Co.

IRISH IMPORTS

DUBLIN, Ireland—Total imports into the Republic of Ireland during 1950, classified as paper, cardboard, etc., were valued at £4,818,274, as against £3,362,855 in 1949.

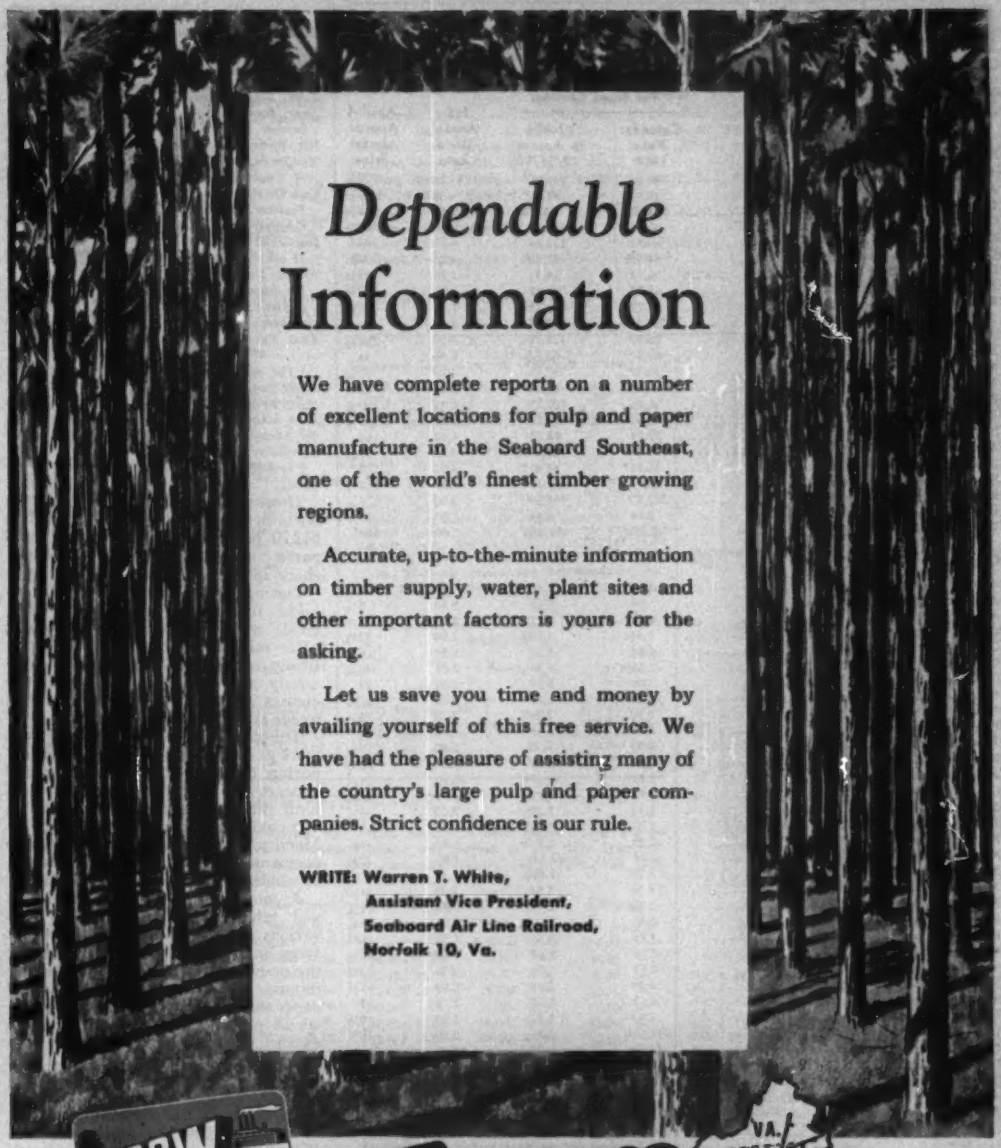
Of these imports, paper-making materials amounting to 21,858 tons accounted for £712,079 in 1950 and 11,056 tons, valued at £282,584 in 1949.

Article	Value 1950	1949
Packing and wrapping paper	£ 47,557	£ 21,882
Tissue paper	32,857	25,672
Oiled, waxed and other waterproof paper	169,275	41,370
Cigarette paper	69,174	52,789
Greaseproof paper	73,152	39,824
Imitation parchment	92,722	52,359
Gummed paper	47,321	29,631
Wall and ceiling paper, printed	38,086	31,713
Cellulose wrapping paper, etc.	164,345	147,048
Other paper	103,305	80,712

POWER DEVELOPMENT

BOSTON, Mass. — The New England Electric System has announced application for a Federal Power Commission license covering construction of a $45 million hydro-electric development on the Connecticut River at Littleton, N. H., and Waterford, Vt.

Work will start as soon as regulatory approvals are received from the several state and federal commissions. Three years will be needed to complete the project.



Dependable Information

We have complete reports on a number of excellent locations for pulp and paper manufacture in the Seaboard Southeast, one of the world's finest timber growing regions.

Accurate, up-to-the-minute information on timber supply, water, plant sites and other important factors is yours for the asking.

Let us save you time and money by availing yourself of this free service. We have had the pleasure of assisting many of the country's large pulp and paper companies. Strict confidence is our rule.

WRITE: Warren T. White,
Assistant Vice President,
Seaboard Air Line Railroad,
Norfolk 10, Va.

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THROUGH THE HEART OF THE SOUTH

Financial News

STOCK REPORT

	Per Share Earnings		Indic Annual Divid. Rate	April 4 Approx. Market Price
PREFERRED STOCKS	Calendar Year 1949	12 Mo. to Approx. 12/31/50		
Armstrong Cork Co. $3.75 Cum.	$40.95*	$48.80*	$3.75	89⅞
Armstrong Cork Co. $4.00 Cum. Conv.	40.95*	48.80*	4.00	116½
Celotex Corp. 5% Cum.	6.80c	14.34h	1.00	17⅛
Champion Paper & Fibre $4.50 Cum.	60.09f	103.62	4.50	102½
Container Corp. of Amer. 4% Cum.	89.52	123.64	4.00	101
Crown-Zellerbach $4.20 Cum.	54.38c	67.00h	4.20	102½
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.93	16.31	2.50	55¼
Flintkote Co. $4.00 Cum.	62.70	90.41	4.00	102⅞
Robert Gair Co., Inc., 6% Cum.	13.79†	21.28†	1.20	19⅜
International Paper Co. $4.00 Cum.	224.55	289.77	4.00	103
Kimberly Clark Corp. 4% Cum.	85.27	114.95h	4.50	108½
MacAndrews & Forbes 6% Cum.	61.59	63.03i	6.00	135
Mead Corp. 4¼% Cum.	51.37	97.08	4.25	97½
Mead Corp. 2% Cum. Conv. 2nd	31.35*	40.05*	2.00	60¼
Pabco Products, Inc., 4% Cum. Conv.	56.46	126.13	4.00	100½
Rayonier, Inc., $2 Cum.	9.54	17.25	2.00	36¼
St. Regis Paper Co. 4.40% 1st A	30.74	65.23	4.40	93
Scott Paper Co. $3.40 Cum.	31.15*	65.41*	3.40	93¾
Scott Paper Co. $4.00 Cum.	31.15*	65.41*	4.00	104
Sutherland Paper 4½% Conv.	46.92	81.31	4.25	113½
U. S. Gypsum Co. 7% Cum.	283.37	348.48	7.00	178½
United Wallpaper Inc., 4% Cum. Conv.	2.14	0.84	2.00	25½
West Virginia Pulp & Paper 4½% Cum.	61.28c	99.26h	4.50	108½
COMMON STOCKS				
APW Products Co.	(d)0.81	0.45i	—	7⅛
American Writing Paper Corp.	.04	2.02	0.50	9⅜
Armstrong Cork Co.	6.57	8.13	3.75	55½
Celotex Corp.	1.65c	3.78h	1.00	17⅜
Certain-Teed Prods. Corp.	2.84	3.92	1.50	16⅝
Champion Paper & Fibre	5.15f	9.44	2.45	50½
Congoleum Nairn Co.	3.04	3.29	2.00	25
Container Corp. of America	4.23	5.87	2.50	35½
Crown-Zellerbach	6.02c	7.34h	2.20	50
Dixie Cup Co.	7.44	12.18	1.50	35
Eastern Corp.	0.04	4.30	1.00	19⅛
Flintkote Co.	4.33	5.83	3.00	30½
Robert Gair Co., Inc.	2.11†	3.37†	0.70	11⅜
Great Northern Paper Co.	4.87	4.33	3.00	49⅛
International Paper Co.	7.12	7.39	2.50	49⅛
Johns-Manville Corp.	4.83	7.22	3.50	57
Kimberly Clark Corp.	5.29	6.28h	1.80	44½
MacAndrews & Forbes Co.	3.64	3.74i	3.00	39⅜
Marathon Corp.	3.29c	3.40h	1.40	43½
Mead Corp.	4.10	5.64	2.20	24½
National Container Corp.	0.95	2.41	0.75	11⅜
Pabco Products, Inc.	0.85	1.87	0.60	19⅜
Rayonier, Inc.	4.75	9.61	2.50	46⅜
Ruberoid Co.	7.93	9.64	3.18	57½
St. Regis Paper Co.	0.91	2.10	0.60	12⅛
Scott Paper Co.	3.04	3.90	2.00	45⅜
Sutherland Paper Co.	4.62	7.66	2.75	46
Union Bag & Paper Corp.	5.01	7.23	3.00	40½
United Board & Carton	(d)1.61b	2.71g	0.50	18½
U. S. Gypsum Co.	13.51	16.70	10.00	116⅝
United Wallpaper	(d)0.01	(d)0.01	—	3⅜
West Virginia Pulp & Paper	8.58c	13.73h	5.00	78

(b) Year ended 11/13/49
(c) Year ended 1/31/50
(d) Deficit
(e) 12 months to 10/31/50
(f) 9 months to 12/31/49
(g) 12 months to 2/3/51
(h) 12 months to 1/31/51
(i) 12 months to 9/30/50
(*) Earnings per combined preferred shares
(†) Includes domestic and Canadian subsidiaries and 60% equity in Southern Paperboard Corp.

Gaylord Container Corp. reports net sales during 1950 totaled $63,849,000 and net earnings for the year were $6,882,000. The year's sales were $11,029,000 higher than in 1949 and $2,718,000 higher than in the previous all-time record year of 1948.

The net earnings of $6,882,000 for 1950 amounted to $2.94 per share of common stock, as compared with $4,129,000 or $1.77 per share in 1949.

Minnesota and Ontario Paper Co. and subsidiaries advised shareholders that the net income for the year 1950, after taxes, was $5,260,462 ($4.09 per share on 1,285,870 shares of the company's stock outstanding at December 31, 1950), totaled $51,323,786. Total current assets as of December 31, 1950, were $23,827,193 and total current liabilities were $8,718,264.

International Paper Co. and subsidiary companies' summary of 1950 and 1949:

Total Production—		
Tons	3,324,885	2,959,420
Total Sales—Dollars	$498,415,714	$415,540,851
Taxes Based on Income	62,581,965	37,326,404
Net Profit	66,647,151	51,646,739
Net Profit per share of Common Stock*	7.38	5.70
Cash Dividends paid on Preferred Stock	920,000	920,000
Common Stock	22,250,000†	17,800,000
Number of Stockholders at end of year	27,479	24,711
Average Number of Employees (exclusive of part time workers)	32,097	30,278
Total Payroll	105,555,939	94,409,928

* The per share earnings have been computed on the basis of the Company's present outstanding (8,900,000) shares of $7.50 per value Common Stock after deducting the amount required to pay the annual dividend on 230,000 shares of the Cumulative $4 Preferred Stock.

† In addition a 25 percent stock dividend was paid.

Howard Smith Paper Mills Ltd. reports net profit of $4,546,007, equal to $12.70 per share for 1950. This compares with $3,161,445 or $8.54 per share in previous year.

During the early part of 1950 demand for company's products, while good, was not excessive. However, after midyear, the demand for practically all products increased tremendously and in spite of moderate increases in production, it was impossible to fill all requests for tonnage.

The demand for paper from export markets showed marked improvement during the last half of the year and appears to be continuing. However, until the new paper machines, one at Cornwall, Ont., and the other at Merritton, come into production, the company will have only a small amount of tonnage to sell in these markets.

A long-term program of extension and rehabilitation of the company's various mills is under way. The first stage involves a cost of $12 million, the main items including, among other things, the installation of the two new paper machines mentioned above; new steam plants at both places, and an extension to the soda pulp mill at Cornwall, which is expected to add 75 tons or more per day to its present output.

Kalamazoo Vegetable Parchment Co., of Espanola, Ont., had a gain of about 15 percent in the first two months of 1951 over the same 1950 period. The current production of the mill, originally designed for a bleached kraft pulp output of 200 tons-per-day, reportedly is running in excess of 275 tons.

The company's capital expenditures for 1951 are planned for over $1 million, including further work on the paper machines, installation of Swedish-designed drying equipment for the pulp machine and expenditures in the woods for all-weather roads, dams or river improvement work and for mechanized equipment.

PRICES

The prices below reflect market quotations in New York at the mill level on standard grades. Most orders accepted, however, at price prevailing on date of shipment. Does not include spot offerings.

PAPER AND BOARD

Standard News, Delivered Ports

Rolls, contract, per ton	$105.00/110.00
Sheets	118.00/ —

F.o.b. Mills, C.l. Frt. allowed, dock, N. Y.

Kraft— pr cwt., 40# base wgt.

Standard Wrapping Rolls	$7.75/ —
No. 1 Wrapping Rolls	8.25/ 8.50
Standard Bag	7.50/ —

Tissues— per ream 24x36 (480) 10 lbs. 2500 lbs or more

Wh. No. 1 Frd.	$1.95 /$2.25
Wh. No. 1 MG	1.95 / 2.25
Wh. No. 1½	1.85 / 2.15
Wh. No. 2	1.85 / 2.15
Kraft Non-Tar	1.85 / 2.15
White Non-Tar	1.95 / —

Toilet— per case of 100 rolls—1 M sheets

Unbleached 4½x4½	$8.00/$8.25
Unbleached 4½x5	6.60/ —
Bleached 4½x4½	‡ 10.00/12.50
Bleached 4½x5	9.85/ —

Per Case of 50 rolls—2000 sheets

Unbleached 4½x4½	‡ $8.00/$9.75
Bleached 4½x4½	6.95/ —

Per Case of 100 rolls—1000 sheets

Facial, 4½x5, 2-ply	$8.95/10.65

Paper Towels— per case of 3750

Wh. Jr. M'tif'd 9½x9½	$5.75
Br. Sr. M'tif'd 9½x12	4.10
Br. Jr. M'tif'd 9½x9½	3.60
Br. Jr. Sgl. fold 9½x10½	3.65
Bldd. 7½x11, 24/25 rolls	‡ $7.00/7.55

Manila, per cwt.

No. 1 Jute Tag, 100-lb., sheets*	$19.55/21.55
Reg. Jute M.F. 40-lb., sheets*	18.00/20.00
Wrapping Manila	8.75/10.50
Printing Manila	10.50/12.00

* Less usual allowance for rolls.

WORLD WOOD PULP MARKETS

Second Quarter Contract Prices, Per Short Air-Dry Ton

Varying freight allowances — Atlantic Ports

	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$85.00/100.00	$95.00/100.00			
Sulphate, Bleached	135.00/175.00	190.00/200.00	*$255.00/315.00		
Sulphate, Unbl. Northn.		145.00/175.00	*225.00/295.00	$200.00/ —	
Sulphate, Unbl. Southn.					
Sulphite, Blchd. (Sftwd.)	135.00/145.00	160.00/175.00	*250.00/290.00	225.00/ —	
Sulfite, Blchd. (Hdwd.)	155.00/ —				
Sulphite, Unbichd.		150.00/160.00	*225.00/265.00	200.00/ —	
Sulphite, Unbl'd (Glassine)			*227.00/ —		
Soda, Bichd.		155.00/160.00			
Siderurgia, Pulping News	106.00/ —	*106.00/ —			

* On dock. † Delivered.

Gummed Tape— per bdl., 500 bdls. or more

90-lb. 375 ft. GSI	$7.20 / —
60lb. 600 ft. GSI	7.20 / —
35-lb. 800 ft. GSI	8.28 / —
35-lb. 500 ft. GSO	6.21 / —

Boards, per ton—

Filled News	$107.50/ —
Plain Chip	105.00/107.50
Bichd. Mix. L-d. Chip	147.50/ —
White Pat. coated .020	170.00/ —
Kraft Liners 42 lb.	115.00/117.50
Kraft Corr. .009	122.50/126.00
Binders Boards	137.50/140.00

The following prices are representative distributors' resale prices.

Rag Content Bonds and Ledgers— White, 20 lb.

Bonds	4 Cms.
	per cwt.
100% Rag Ex. No. 1	$70.45/$72.10
100% Rag	62.45/ —
75% Rag	48.15/ —
50% Rag	38.90/ —
25% Rag	31.65/ 33.00

Ledgers	4 Cms.
	per cwt.
100% Rag Ex. No. 1	$72.65/ —
100% Rag	63.90/ —
75% Rag	48.40/ —
50% Rag	40.20/ —
25% Rag	33.60/ —

Sulphite Bonds and Ledgers White, 20 lb.

Bonds	4 Cms.
	per cwt.
Watermarked	$19.00/$20.50
Plain	18.05/ 19.50

Ledgers	4 Cms.
	per cwt.
Watermarked	$20.30/$21.80
Plain	19.35/ 20.80

White Rock

Conversion Coated	Case
	per cwt.
No. 1	$23.40/$24.65
No. 2	21.90/ 23.40
No. 3	20.40/ 22.40
Machine Coated	
No. 1	$18.15/$18.40
No. 2	16.15/ 16.65
Uncoated	
No. 1 Antique (Watermarked)	$18.65/$19.15
Offset	17.40/ 19.90
A Grade E. F.	17.40/ 18.15
A Grade S. C.	18.15/ 18.65
B Grade E. F.	17.65/ —
B Grade S. C.	16.90/ 18.40

‡ Indicates a price change.

WASTE PAPER MARKET

The following quotations were gathered from major dealers in each market. They are an indication of the price range in which volume tonnage was moving on the date specified. Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) PENDING OPS ROLLBACK, THESE PRICES REPRESENT CEILING RANGE.

	New York	Philadelphia	Boston	Chicago
	March 26	Jan. 25	March 26	April 2
No. 1 Mixed Paper	$32.00/ 35.00	$32.00/ 35.00	$29.00/ 32.00	$27.00/ —
Boxboard Cuts	30.00/ 33.00	30.00/ 33.00	26.00/ —	28.00/ —
Mill Wrappers	30.00/ 35.00	30.00/ 35.00	30.00/ 36.00	35.00/ —
No. 1 News	37.00/ 41.00	33.00/ 40.00	28.00/ 31.00	35.00/ —
Over-issue News	40.00/ 45.00	40.00/ —	33.00/ 45.00	41.00/ —
Corrugated Containers	64.00/ 70.00	55.00/ 62.00	40.00/ 61.00	52.00/ —
New Corrugated Cuts	74.00/ 80.00	55.00/ 60.00	55.00/ 65.00	62.00/ —
Double Kraft Ld. Corr. Cuts	115.00/120.00	105.00/110.00	120.00/140.00	120.00/ —
100% Kraft Corr. Cuts	140.00/165.00	125.00/135.00	130.00/170.00	135.00/ —
Used Kraft Bags	85.00/ 95.00	80.00/ 85.00	85.00/116.50	65.00/ —
No. 1 Brown Kraft Paper	90.00/ 95.00	90.00/ 95.00	90.00/110.00	65.00/ —
Super Resorted Br. Kraft	100.00/105.00	100.00/105.00	100.00/123.00	90.00/ —
New Br. Kraft Env. Cuts	160.00/190.00	160.00/175.00	160.00/180.00	150.00/ —
New Br. Kraft Cuts	150.00/170.00	130.00/135.00	150.00/180.00	140.00/ —
No. 1 Gdwd Shvs.	80.00/ 85.00	75.00/ 80.00	80.00/ 85.00	75.00/ —
White Newsblanks	115.00/125.00	110.00/115.00	110.00/120.00	115.00/ —
No. 1 Flyleaf Shvs.	90.00/ 85.00	90.00/ 95.00	95.00/110.00	110.00/ —
No. 1 Soft Wht. Shvs.	180.00/190.00	170.00/175.00	175.00/195.00	175.00/ —
Super Soft Wht. Shvs.	190.00/200.00	190.00/200.00	190.00/210.00	185.00/ —
Hd. Wht. Shvs.	185.00/210.00	200.00/215.00	190.00/215.00	180.00/ —
Hd. Wht. Env. Cuts	200.00/245.00	225.00/ —	200.00/235.00	190.00/ —
New Manila Env. Cuts	140.00/150.00	160.00/165.00	140.00/165.00	115.00/ —
Col. Tab Cards	110.00/120.00	115.00/120.00	95.00/150.00	100.00/ —
Manila Tab Cards	170.00/185.00	165.00/175.00	160.00/200.00	165.00/ —
No. 1 Mixed Ledger	100.00/105.00	100.00/105.00	90.00/110.00	100.00/ —
White Ledger	130.00/140.00	125.00/130.00	125.00/140.00	125.00/ —
No. 1 Book & Mag.†	55.00/ 60.00	40.00/ 45.00	40.00/ 60.00	35.00/ —
No. 1 Rep'd. Hvy. Books‡	65.00/ 70.00	50.00/ 60.00	60.00/ 75.00	35.00/ —

* Delivered. † Includes Time & Life; no excess groundwood. ‡ Not to exceed 10% groundwood.

RAG MARKET

New Domestic Cotton Cuttings
(Prices to Dealers, F.o.b. Ship. Pt.)

ALL PRICES NOMINAL

No. 1 White Shirts	$23.00/$24.00
No. 1 Unbichd. Muslins	23.00/ 24.00
Bichd. Canton Flannels	17.00/ 18.00
No. 1 Lt. Silesias	12.00/ 13.00
No. 1 Lt. Prints	9.00/ 12.00
Wht. Bk. Blue Overalls (Bichable)	15.50/ 16.00
No. 1 Blue Overalls	7.00/ 8.00
Fancy Shirts	6.00/ 6.50
No. 1 Washables	5.50/ 6.00
Sumtan Khaki Cuts	11.00/ 12.00
Mixed Khaki Cuts	9.00/ 11.00
Corduroy Cuts	4.75/ 5.25
Cottonades	7.00/ 7.50
Bichd. Underwear Cuts	nominal
Unbichd. Underwear Cuts	nominal

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

ALL PRICES NOMINAL

	Per 100 lbs.
Mixed White	$5.00/$5.50
Cotton Pants & Overalls	4.75/ 5.00
Thirds and Blues, Repacked	3.75/ 4.00
No. 1 Roofing Rags	3.00/ 3.10
No. 2 Roofing Rags	2.40/ 2.50
No. 1 & 4 Roofing Rags	2.20/ 2.30
Roofing Bagging	2.30/ 2.30

New Foreign Cotton Cuttings
(Prices to Mills, F.o.b. Dock, N.Y.)

	Per 100 lbs.
New Duck Cuttings	$4.75/$5.00
New Mixed Cuttings	4.75/ 5.25
Light Silesias	8.00/ 8.50
Light Flannelettes	7.50/ 8.00
New White Cuttings	nominal
New Unbleached Cuttings	nominal
Fancy Shirt Cuttings	6.50/ 7.50

Light Prints	6.50/ 7.50
Bleachable Khaki, No. 1	6.00/ 6.50
Unbl. Khaki, No. 1	5.00/ 5.50

Old Foreign Rags

(Prices to Mills, F.o.b. Dock, N. Y.)

	Per 100 lbs.
No. 1 White Cottons	nominal
No. 2 White Cottons	nominal
No. 3 White Cottons	nominal
No. 4 White Cottons	nominal
Extra Light Prints	5.50/ 6.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	3.75/ 4.00
Dutch Blue Cottons	4.00/ 4.50
Linsey Garments	2.75/ 3.00
Dark Cottons, Egyptian	2.50/ 2.75
Dark Cottons, European	2.75/ 3.00
Old Shapperies	2.40/ 2.50
New Shapperies	2.50/ 2.75

Bagging

(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$8.00/$8.25
Domestic Gunny, No. 1	7.75/ 8.00
Heavy Wool Tares	7.00/ 7.50
Foreign Manila Rope	7.25/ 7.75
Domestic Manila Rope	7.00/ 7.25
Jute Strings	6.25/ 6.50
No. 1 Sisal Strings	7.25/ 7.50
Mixed Strings	nominal
Paper Mill Tares	5.25/ 5.75
No. 1 Scrap Burlap	
Foreign	6.50/ 6.75
Domestic	7.00/ 7.50
Austr. Wool Pouches	7.50/ 8.50
New Burlap Cuttings	7.50/ 8.00

MATERIALS

Aluminum, sulfate:		
comi. bags, wks. cwt.	1.65	
iron-free c.l.	3.25	
Alcohol, ethyl:		
tax free, dms. c.l. gal.	.77	/ 1.02
dnld. East Miss.		
Alcohol, methyl:		
Synthetic, Zone 1, dms. c.l. flt. alld. gal.	.44	
Casein, acid-prec.:		
dom. sh. pt. c.l. lb.	.42	/ .43
imp. ex. dock lb.	.36½/	.39½
Caustic soda:		
c.l. wks. solid, 76%, cwt.	3.35	
flak. & grd. 100-lb. drums	3.75	
liquid 50% tanks	2.55	
liquid 70% tanks	2.65	
China clay:		
dom. air-float. filler, c.l. wks. ton	10.00	
water-washed, lump, filler	11.00	
coating	17.60	/38.50
imported, ex whse. short ton	15.20	/28.35
Chlorine:		
single-unit tanks, works. cwt.	2.70	
multi-unit cwt.	3.20	/ 4.40
Formaldehyde:		
USP, ink. dms, c.l. wks. lb.	.0600/	.0625
l.c.l. E. wks.	.0650/	.0675
Fuel oil:		
Bunker C, No. 6 Cal. bry		
tanks, refinery bbl.	1.95	/ 2.15
light bbl.	2.05	/ 2.10
Hydrogen peroxide:		
USP, 35% cbys. E. of Miss. lb.	.34½/	.35½
Lime:		
hydrated, bags, wks. Buffalo ton	13.50	
Rosin:		
B gum, drms, c.l. Savan. cwt.	8.00	
G, H, I, K cwt.	8.70	/ 8.75
FF, wood, do. cwt.	7.30	
Rosin size:		
70%, gum & pale grds, tank cars, south, sh. pt. cwt.	6.90	/ 7.00
Salt cake:		
dom. bulk, c.l. wks. ton	17.00	
wks. frt. all. ton	20.00	/22.00
Soda ash:		
light, 58%, bags, wks.	1.50	
bulk cwt.	1.30	
Sodium silicate 40°:		
turbid. c.l. wks. cwt.	1.30	/
l.c.l. wks.	1.60	/ 1.85
Sodium peroxide:		
dms. c.l. E. of Miss. lb.	.19	
l.c.l. do. lb.	.19½/	.20
Soybean, protein:		
chem. ind, wks. c.l. lb.	.34	/ —
Cinn. and Chic.		
Sulfuric acid:		
60° Be. cbys. cl. wks. cwt.	1.75	/ —
l.c.l. wks. cwt.	2.05	/ 2.60
Sulfur:		
crude, c.l. mines, contract, long ton	21.00	/22.00
f.o.b vessels Gulf	22.50	/23.50
Export, f.o.b. Gulf	25.00	
Sulfur dioxide:		
liquid, comi. cyl. wks. lb.	.09	
multi-unit cars lb.	.0525	
Starches:		
pearl corn, bags, c.l. wks. cwt.	6.19	/ —
white dextrines, c.l. wks. cwt.	7.48	/ —
potato, Idaho, c.l. wks. cwt.	5.30	/ —
potato, Maine, c.l. wks. cwt.	5.25	/ —
tapioca, conv. dextrines cwt.	8.25	/ 8.75
medium grds. Gulf and East Coast ports	6.75	/ 7.50
low, Siam, on dock N. Y.	5.75	/ 6.00
	nominal	
Talc:		
domestic, 50-lb. sacks, c.l. wks. ton	25.00	/30.00
Titanium dioxide:		
anastase, c.l. dnld., bags. lb.	.21	/ .21½
l.c.l. dnld. lb.	.22	/ .22½
rutile, c.l. dnld. lb.	.23	/ .23½
l.c.l. dnld. lb.	.24	/ .24½

N.B.: For special market conditions, see *Trends*.

U. S. IMPORTS

WOODPULP

Preliminary, February, 1951

Item	Country of Origin	Short Tons
Mechanical		
Unbichd.	Canada	18,567
	Sweden	237
	Norway	1,689
	Finland	1,107
		21,600
Screenings	Canada	276
Bichd.	Canada	728
Chemical		
Sulfite, Unbichd.	Canada	30,257
	Sweden	12,038
	Austria	390
	Finland	1,879
		44,564
Screenings	Canada	505
Sulfite, Bichd. Rayon & Special Chem. Grades	Canada	15,402
	Sweden	113
		15,515
Other	Canada	21,121
	Sweden	3,489
	Norway	5,042
	Austria	414
	Finland	2,622
	Italy*	144
		32,832
Sulfate, Unbichd.	Canada	14,099
	Sweden	8,119
	Finland	12,260
		34,478
Sulfate, Bichd.	Canada	41,936
	Sweden	10,979
		52,915
Soda, Unbichd. & Bichd.	Canada	2,357
Totals, February	Canada	145,248
	Sweden	34,975
	Norway	6,731
	Finland	17,868
	Austria	804
	Italy	144
		203,770

* To be investigated by Census.

"EXCELSIOR" FELTS

The Trademark of Felts of Superior Quality for Every Grade of Pulp and Paper

KNOX WOOLEN COMPANY

CAMDEN, MAINE

IMPORTS

IMPORTS AT NEW YORK

Week Ending March 31

Newsprint

Madden Reeve Angel & Co., Inc., Minnesota, Hango, 3175 rolls.

Wallpaper

S. E. Lonergren, Stockholm, Gothenburg, 162 ctns.

E. Miltenberg, Texas, Shimidzu, 10 cs.

Victor England Agencies, Texas, Yokohama, 8 cs.

Intermaritime Forwarding Co., American Producer, London, 139 ctns.

Wrapping Paper

Chemical Bank Trust Co., Stockholm, Gothenburg, 66 rolls.

Jay Madden Corp., Sirius, Rauma, 362 rolls (sulphite).

Resolute Paper Products Co., Sirius, Rauma, 122 rolls (sulphite).

Paper Corp. of U. S., Egidia, Glasgow, 50 rolls.

(———), American Flyer, Havre, 65 cs. (cellophane).

Great A. & P. Tea Co., Arenadyk, Antwerp, 26 cs.

Parchment

Meadows Wye & Co., Queen Elizabeth, Southampton, 1 cs.

Intermaritime Forwarding Co., Queen Elizabeth, Southampton, 1 cs.

Bulkley Dunton Paper Co., Millernstor, Hamburg, 12 bls. (paper).

Baryta Coated Board

E. I. du Pont de Nemours & Co., American Producer, London, 175 rolls.

Baryt Paper

R. Wilson Paper Corp., Arenadyk, Bremen, 28 cs.

W. Reimerdes, American Clipper, Bremen, 118 cs.

Paper Napkins

American Express Co., Paraguay, Copenhagen, 26 cs.

Freund Mayer Co., Paraguay, Copenhagen, 40 ctns.

Drawing Paper

Winsor Newton, Inc., American Producer, London, 5 cs.

H. Tusis, Inc., Westerdam, Rotterdam, 1 cs.

H. Reeve Angel & Co., Inc., Queen Elizabeth, Southampton, 2 cs.

Filter Paper

Stevens Nelson Paper Corp., American Producer, London, 1 cs.

H. Reeve Angel & Co., Inc., Queen Elizabeth, Southampton, 24 cs.

Cloth Paper

I. L. Hartman, Martin Bakke, Kobe, 14 cs.

Crepe Paper

Brundage Merchandise Co., American Attorney, Rotterdam, 27 cs.

Brundage Merchandise Co., Westerdam, Rotterdam, 27 cs.

Surface Coated Paper

Gevaert Co. of America, American Attorney, Antwerp, 17 cs.

Gevaert Co. of America, Robert Maersk, Antwerp, 27 cs.

Sulphite Paper

B. M. Heede, Stavangerfjord, Oslo, 32 pkgs.

Paper Board

Schwartz & Co., Black Hawk, Rotterdam, 12 rolls.

Printing Paper

Hudson Shipping Co., American Producer, London, 24 cs.

S. H. Pomerance, American Producer, London, 4 cs.

Stevens Nelson Paper Corp., American Producer, London, 1 cs.

Winsor Newton, Inc., American Producer, London, 3 cs.

Gummed Paper

B. F. Drakenfeld & Co., Parthia, Liverpool, 41 cs.

Serviettes

H. W. Robinson Co., American Producer, London, 2 cs.

(———), Parthia, Liverpool, 12 crates.

Photo Paper

Alco Photo Supply Corp., Queen Elizabeth, Southampton, 16 cs.

Miscellaneous Paper

M. J. Corbett & Co., Arenadyk, Rotterdam, 3 cs.

E. Miltenberg, Westerdam, Rotterdam, 30 pkgs.

Rags, Boggings, etc.

Railway Supply & Manufacturing Co., Robert Maersk, Antwerp, 54 bls. jute waste bagging.

Midwest Waste Materials Co., Arenadyk, Rotterdam, 109 bls. old jute.

1st National Bank of Boston, Igadi, Hong Kong, 50 bls. rags.

J. Stein, Morrio, Buenos Aires, 29 bls. rags.

(———), Millernstor, Antwerp, 99 bls. paper-stock waste.

Robbins Forwarding Co., American Producer, London, 98 bls. cotton rags.

National City Bank, American Producer, London, 42 bls. cotton rags.

E. J. Lang, American Manufacturer, Manchester, 57 bls. old bagging.

(———), American Manufacturer, Manchester, 14 bls. twines.

Loumar Textile By Products Co., American Manufacturer, Manchester, 169 bls. old bagging.

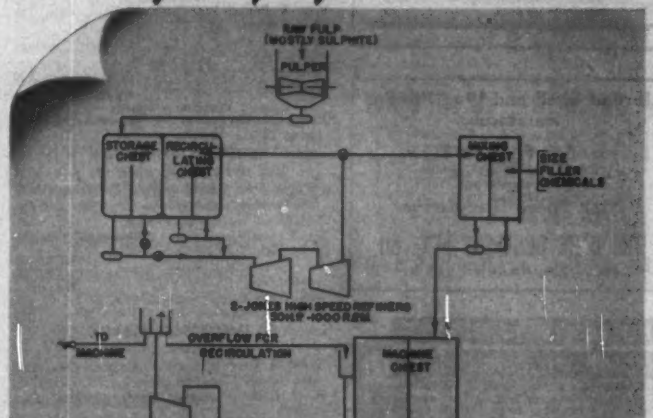
Salzler Trading Co., American Manufacturer, Manchester, 66 bls. jute waste.

A. Siegle Corp., American Manufacturer, Manchester, 90 bls. jute waste.

Loumar Textile By Products Co., American Manufacturer, Liverpool, 50 bls. old bagging.

Midwest Waste Materials Co., Rouda, Rouen, 242 bls. scrap bagging, 122 bls. rags.

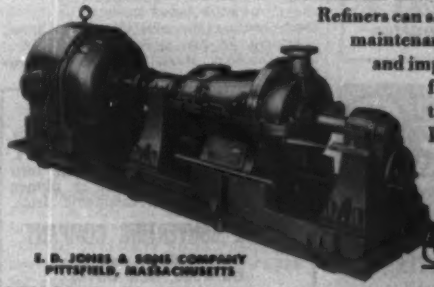
"... completely replaced 10 beaters"



The *flow-chart* above illustrates how a well-known mill in France is using 3 JONES HIGH-SPEED REFINERS in preparation of all their stock. Production at this mill is 18 tons per day of printing and bond papers . . . which figures out to 200 horsepower hours per ton for refining.

This installation is saving 20% in power — and 15 man-hours per day — and giving complete satisfaction.

To find out how Jones High-Speed Refiners can save on power, keep maintenance to a minimum and improve stock control for you, write us today for Bulletin EDJ-1011A.



E. D. JONES & SONS COMPANY
PITTSFIELD, MASSACHUSETTS

Jones

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering Reports, Consultation and Valuations
80 Federal Street Boston 10, Mass.

DODGE
of Mishawaka, Ind.
FIRST IN POWER TRANSMISSION MACHINERY

Jordan Shell and Plug Fillings
TRADE-MARK
POSITIVE
Reg. U. S. Pat. Off.
High Speed Disc Refiner
THE BAHR BROTHERS MFG. CO.
MARION, INDIANA, U.S.A.

NEW PROCESSING METHODS—
LOWER OPERATING COSTS
The *Ferguson First Team* has experience-qualified paper mill specialists—engineers who understand your processing problems can affect new economies in both manpower and capital.
Preliminary Discussions in Confidence and Without Obligation.
THE H. K. FERGUSON COMPANY
ENGINEERS AND BUILDERS
Headquarters: Ferguson Building, Cleveland, Ohio
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THE RUST ENGINEERING COMPANY
Engineers and Constructors
Pittsburgh, Pennsylvania
Complete Service for
PULP AND PAPER MILLS—PLANTS AND FACILITIES
DESIGN, CONSTRUCTION, MODERNIZATION

MISCO
STAINLESS STEEL CASTINGS
FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS
MICHIGAN STEEL CASTING CO.
DETROIT 7, MICHIGAN

D. Benedetto, Ronda, Rouen, 41 bls. rags.
(———), Ronda, Rouen, 73 bls. rags.

Old Rope

National City Bank, Robert Maersk, Antwerp, 76 rolls.
E. J. Keller Co., Inc., Robert Maersk, Rotterdam, 78 bls. (old manila).
National City Bank, Arendsyk, Rotterdam, 37 bls.
(———), Wgidia, Glasgow, 60 bls. (old manila).
Bemis Bros. Bag Co., Black Hawk, Rotterdam, 52 coils.
C. Smiles, American Manufacturer, Manchester, 300 bls. (waste cordage).
(———), American Producer, London, 38 coils.

Casein

N. Y. Trust Co., Uruguay, Buenos Aires, 2,000 bags.
American Cyanamid Co., Uruguay, Buenos Aires, 2,400 bags.
(———), Fletero, Buenos Aires, 3,000 bags.
H. S. Cramer, Black Hawk, Antwerp, 300 bags.
National Casein Sales Co., American Flyer, Havre, 500 bags.
The Borden Co. Chemical Co., American Flyer, Hamburg, 331 bags.

Woodpulp

Price & Pierce, Ltd., Stavangerfjord, Oslo, 120 bls. sulphate pulp.
Perkins Goodwin & Co., Stockholm, Gothenburg, 504 bls. woodpulp.
Gottesman & Co., Topdalsfjord, Trondheim, 900 bls. Easy bleaching sulphite pulp.

Woodpulp Boards

Parsons & Whitemore, Inc., Stockholm, Gothenburg, 75 bls., 73 rolls.

IMPORTS AT NEWARK

Week Ending March 31

Cellulose Sales Co., Glimmaren, Gothenburg, 4175 bls. sulphite pulp, 925 bls. dry sulphite pulp, 1800 bls. kraft sulphate pulp.
Jay Madden Corp., Sirius, Helsingfors, 1154 bls. 136 rolls woodpulp boards.
Pulp Sales Corp., Sirius, Rauma, 2449 bls. sulphite pulp.
Pulp Sales Corp., Sirius, Helsingfors, 1105 bls. sulphite pulp.

IMPORTS AT ALBANY

Week Ending March 31

Castle & Overton, Inc., Vindeggen, Oslo, 1250 bls. bleached sulphite pulp.
K. O. Hohle, Vindeggen, Sande, 3750 bls. woodpulp.
Castle & Overton, Inc., Vindeggen, Tofte, 610 bls. sulphate pulp, 2400 bls. sulphite pulp.

IMPORTS AT PORTLAND

Week Ending March 31

Cellulose Sales Corp., Paraguay, Sundsvall, 2608 bls. sulphite pulp, 8688 bls. sulphate pulp.

IMPORTS AT BOSTON

Week Ending March 31

F. H. Paul & Stein Bros., American Flyer, Havre, 100 bags casein.
J. A. Conkey, American Manufacturer, Liverpool, 9 cs. gauze carbonizing tissue paper.
Cellulose Sales Corp., Paraguay, Sundsvall, 2550 bls. sulphate pulp, 2250 bls. sulphite pulp.
H. G. Lichtenstein, American Manufacturer, Manchester, 49 bs. new light prints.

IMPORTS AT PHILADELPHIA

Week Ending March 31

Dutch American Mercantile Corp., Black Hawk, Antwerp, 500 bags casein.
(———), Black Hawk, Rotterdam, 500 bags casein.

FOR OVER 10 YEARS
we have been converting for others. We can put your facial tissue into boxed goods, toilet rolls or dinner napkins at a very reasonable price.
TISSUE CONVERTING COMPANY
589—1 South Avenue
Garwood, New Jersey

Madden Reeve Angel & Co., Inc., Sirius, Helsingfors, 47 rolls newsprint.
Pulp Sales Corp., Sirius, Rauma, 4096 bls. sulphite pulp.
Jay Madden Corp., Sirius, Rauma, 240 rolls wrapping paper.
Pulp Sales Corp., Minnesota, Hango, 2108 bls. mechanically ground woodpulp.
Stora Kopparberg Corp., Minnesota, Stockholm, 350 bls. dry chemical pulp.
Madden Reeve Angel & Co., Inc., Minnesota, Hango, 350 rolls newsprint, 246 rolls sulphite wrapping paper.
Pulp Sales Corp., Minnesota, Hango, 176 rolls paper waste.
Bulkley Dunton Pulp Co., Arenadyk, Rotterdam, 1103 bls woodpulp.
Elof Hansson, Inc., Glimmaren, Gothenburg, 5000 bls woodpulp.
Cellulose Sales Corp., Paraguay, Sundsvall, 150 bls sulphate pulp, 2500 bls sulphite pulp.
Gottesman & Co. Inc., Paraguay, Sundsvall, 2895 bls sulphite pulp, 875 bls sulphate pulp.
Bulkley Dunton Pulp Co., Paraguay, Sundsvall, 660 bls. sulphate pulp.
1st National Bank, Robert Maersk, Rouen, 51 bls rags.
E. J. Lang, American Manufacturer, Liverpool, 57 bls old bagging.
E. J. Lang, American Producer, London, 58 bls old bagging.
Gottesman & Co., Paraguay, Sundsvall, 2895 bls unbleached sulphite pulp.

IMPORTS AT NORFOLK

Week Ending March 31

Bowater Paper Co., Cornerbrook, Cornerbrook, 1660 rolls newsprint.
Bunzl & Biach, City of Bristol, Calcutta, 100 bls old jute rags.
National City Bank, Black Hawk, Antwerp, 237 bls jute waste.
A. de Vries Trading Corp., Alstertor, Antwerp, 92 bls jute waste.
Castle & Overton, Inc., City of Bristol, Colombo, 200 bls paperstock.
Darmstadt Scott & Courtney, Steel Fabricator, Colombo, 50 bls old jute rags.
E. J. Keller Co. Inc., Steel Fabricator, Bombay, 200 bls jute rags.
(———), American Manufacturer, Manchester, 38 bls bagging.
Darmstadt Scott & Courtney, American Manufacturer, Manchester, 62 bls scrap tares.
National City Bank, American Producer, London, 109 bls old bagging.
A. de Vries Trading Corp., Ronda, Rouen, 56 bls scrap bagging.
D. Benedetto, Ronda, Rouen, 11 bls old bagging.

IMPORTS AT BALTIMORE

Week Ending March 31

Pulp Sales Corp., Minnesota, Hango, 4395 bls sulphate pulp, 1092 bls dry mechanically ground pulp, 2100 bls sulphite pulp.
Jay Madden Corp., Minnesota, Hango, 451 rolls white woodpulp board.
Cellulose Sales Corp., Minnesota, Stockholm, 980 bls sulphate pulp.
S. Shapiro & Sons, Alstertor, Antwerp, 18 bls old cotton rags.

NEW LITERATURE

Railway Age. Booklet, "The Highway Crisis." Elaborates on the subject "The Public Interest in Weight Limitation of Long-Haul Trucks and Adequate Fees for Use of the Highways by Heavy Vehicles."

Film Research Associates. Staff Service Bulletin No. 15, "Film Guide on Production and Management Methods," price $1.50. Furnishes details on more than 150 films from 61 indicated sources and contains a discussion of

audio-visual methods by Dr. Louis S. Goodman.

International Correspondence Schools of Scranton, Pa. News Release, "Flexibility, Speed in New 'Selective' Training Plan." Introduces a new kind of industrial training plan which enables individual companies to organize different courses of study for each worker who needs training in specific operations.

Stonhard Co. Brochure, "Stonhard Stonpach — The Outstanding Flooring Development For Extreme Conditions."

W. C. Hamilton & Sons. Book, "Sample Book of Business Papers." An easy-to-read description of sizes, weights, finishes and qualities.

The Babcock & Wilcox Tube Co. Technical Bulletin 19, "B & W Stainless Croloy Tubing Steels — Seamless and Welded."

Townotor Corp. Certified Job Study No. 10. Prepared to show in detail methods which reduced loading costs 75 percent and tripled warehouse capacity with 12-ft. stacking of heavy loads of steel and parts.

General Electric Co. News Release, "15th 'More Power to America' Program: Training Course in Motor Selection and Application." To aid in the rapid training of industrial personnel. Made up of nine 35-mm black and white slidefilms, student review booklets on each lesson, and an instructor's manual.

SUPPLIERS

PAISLEY PRODUCTS, INC., recently announced several additions and changes in its Midwestern sales staff, including the opening of two new offices and the addition of three men to its field sales force.

Iven G. Nichol of the Central Ohio territory has been moved to Pittsburgh and will handle the Western Pennsylvania territory and adjoining portions of West Virginia.

Art Hess of the Chicago office sales staff has been located at Cincinnati, Ohio, covering the Miami Valley area and the state of Kentucky.

Malcolm Robinson, Cincinnati, moves to the new Southwestern office at Little Rock, Ark., and will cover an area from Nashville, Tenn., to Fort Worth, Texas, including his home state of Arkansas.

Warren Van Etten will represent his company in Central and Southeast Ohio and Western West Virginia with headquarters at Columbus, Ohio.

PENNSYLVANIA SALT MANUFACTURING CO. has formed a new sales department, the Industrial Chemicals Department, combining the former heavy chemicals and special chemicals departments.

The new department will be headed by Albert H. Clem, formerly assistant to the vice-president in charge of sales.

GOLDEN-ANDERSON VALVE SPECIALTY CO., Pittsburgh, Pa., announce the election of Grant A. Colton as president. Mr. Colton was formerly vice-president and general manager.

Hooker Electrochemical Co., Niagara Falls, N. Y., has announced the appointment of Dr. Theset C. Dauphiné as manager of sales development of the company. Dr. Dauphiné has been associated with the Oronite Chemical Co. since 1946 as eastern manager of product development and prior to that was a supervising engineer for the California Research Corp. Both Oronite and California Research Corp. are wholly owned subsidiaries of Standard Oil Co. of Calif. From 1936 to 1939, he was an instructor in the chemical engineering department of Massachusetts Institute of Technology.

MARTIN DRISCOLL & CO. has announced the establishment of Driscoll's Standard Coatings Division.

The division, which will cover aniline, rotogravure and coating needs in the paper converting field, was formed by combining the Aniline and Rotogravure Ink Department of Martin Driscoll & Co. with the recently purchased Standard Coatings Co. of Chicago. This combination enables Driscoll to furnish a complete line of inks and coatings to the many types of paper converters in the industry.

RAYBESTOS-MANHATTAN, INC., announces that P. H. Hagen of Seattle, Wash., has joined its West Coast Sales Division to handle the sale of Manhattan mechanical rubber products and R/M Packings in the Pacific Northwest with headquarters at 2221 4th avenue, South, Seattle.

BETZ ENGINEERING SALES CO., New Orleans, La., of which Allan W. Betz is president, has been named to represent the Warren Steam Pump Co., Warren, Mass., in the southern states, from Texas to Florida, inclusive.

CANADIAN NEWSPRINT SUPPLY CO.
370 Lexington Avenue, New York 17, N. Y.
Telephones: OREGON 9-3870-71-72-73
Cable Address: HORNINTCOM
We are soliciting offerings of NEWSPRINT in rolls and sheets; GROUNDWOOD PRINTING PAPERS and specialties; SULPHATE BOND PAPER and specialties; KRAFT WRAPPING PAPER for export.

FRANK C. VAUGHAN
STUDIES, DESIGNS, ESTIMATES, CONSTRUCTION, MANAGEMENT AND OPERATION
for
KRAFT, SEMI-CHEMICAL PULP PAPER AND STRUCTURAL BOARD MILLS
RICHMOND, VA.

nalco WATER TREATMENT
BOILER WATER
SLIME CONTROL
ANTIFOAM
SIZE CONTROL
PITCH CONTROL
Gets Dependable Results
NATIONAL ALUMINATE CORP.
6221 W. 66th Place • Chicago 38, Illinois

MILL COGS
We make a specialty of "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "C" and instruction sheets free.
The N. P. BOWSHER Co., South Bend, Ind.

APPLETON FELTS
FOR SERVICE!
APPLETON WOOLEN MILLS APPLETON

FIBER RESEARCH AND SERVICE
Semi-Chem. and Chemical Pulp Processes
Pilot Plant Facilities
THE KINSLEY CHEMICAL COMPANY
Cleveland 11, Ohio

B.F. PERKINS & SON, INC.
ENGINEERS AND MANUFACTURERS
HOLYOKE MASSACHUSETTS

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Feb. 24	Mar. 3	Mar. 10	Mar. 17	Mar. 24
1951	102.5	102.7	101.5	103.1r	103.9
	Feb. 25	Mar. 4	Mar. 11	Mar. 18	Mar. 25
1950	95.9	95.8	96.8	96.5	97.6

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	92.6	95.6	96.7	95.4	96.4	97.7	85.3	99.6	96.1	101.3‡	100.3‡	93.7‡	95.8‡
1951	99.3‡	101.5‡											

‡ Preliminary.
r Revised.

COMPARATIVE YEARLY SUMMARIES

	1944	1945	1946	1947	1948	1949	1950	1951
Year to Date	88.4	88.4	98.6	101.2	100.5	92.6	100.7	101.1
Year Average	88.1	89.4	100.1	104.3	96.2	88.6	95.8‡	

PAPERBOARD OPERATING RATIOS†

	Feb. 24	Mar. 3	Mar. 10	Mar. 17	Mar. 24
1951	105	105	106	106	105
	Feb. 25	Mar. 4	Mar. 11	Mar. 18	Mar. 25
1950	90	88	89	92	95

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1950	88	92	91	92	91	94	82	100	96	102	101	95	94
1951	102	105											

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: The chart shows the ratio through December 1950 on the basis of 6-day capacity. Beginning with January 1951 the ratio is shown on the new basis of normal 6- and 7-day capacities. Corresponding weekly and monthly ratios for 1950 on the new basis, shown in the tables above, are somewhat lower.

Paperboard operating ratios continue on the basis of a 6-day week.

† Per cents of operation based on "inch-hours" reported to the National Paperboard Association.

BORDEN CO. has announced the appointment of Barton B. Wadsworth and Dr. Edward L. Kropa as divisional vice-presidents. Eugene J. Sullivan, former assistant sales manager of specialty products, was named sales manager for the company's line of industrial adhesives.

WARREN STEAM PUMP CO., INC., announce that effective April 15, 1951, they will be represented in Louisiana, Mississippi, and Alabama, together with sections of Florida and Arkansas by Betz Engineering Sales Co., 1225 Magazine Street, New Orleans. This includes Warren and Warren-Quimby Pumps for both industrial and marine applications.

GENERAL DYESTUFF CORP., New York City, has named Donald M. Martin, formerly sales manager of the Organic Chemicals Division, as advertising manager of the Antara Products Division.

LINDSAY WIRE WEAVING CO., 14001-14299 Aspinwall Avenue, Cleveland 10, Ohio, has added 20,000 square feet of manufacturing space by acquiring the former plant of The East Shore Machine Products Co. on nearby E. 140th street. The over-all production facilities will be increased by the erection of new looms and new wire cloth finishing equipment. Expansion will also be felt in other departments, such as wire drawing, laboratory and engineering.

THE PULP & PAPER TRADING CO.
21 EAST 40TH STREET, NEW YORK 16 LEXINGTON 2-8640
New England Representative—CHARLES J. BROWN
131 State Street, Boston 9, Mass.—Tel.: Richmond 2-2332
TWX (Teletype) N. Y. 1-484

Rogers PAPERS
Folding Bristol, Index Bristol, Au Sable Bristol, Mill Blanks, Thindex Bristol, Antique Cover, Leathermade Cover, Ninety-leather Cover, Ledger, Bond, Ninepoint Postcard Whiteface Tag, Folder Tag.
Sulphite Converting Specialties

Distributors for Pulp made by:
Consolidated Paper Sales, Ltd.
Montreal, Canada
Laurentide & Port Alfred
Unbleached Sulphite and Wayagamack Kraft

W. O. HISEY

JOINS SANDY-HILL

W. O. Hisey is joining the Sandy Hill Iron & Brass Works about May 15. Mr. Hisey leaves a position as consulting and development engineer in pulp and paper manufacture with the Union Corp., Ltd., a mining and financial house which controls the operation of the South African Pulp and Paper Industries Ltd. Mr. Hisey went to South Africa in 1944 and while there he supervised the rebuilding of both the pulp mill and the paper mill. The pulp mill has been completely reconstructed as a modern bleached sulphate mill using local timber. Since 1948 he has been on the board of directors of the South African Pulp and Paper Industries Ltd.

Mr. Hisey's experience qualifies him for a position in the field of sales and engineering at Sandy Hill. His duties in South Africa will be terminated about April 7. From there he will go to Egypt in the interest of Sandy Hill's business in that area, returning to the United States about May 1 when he will assume his permanent position at the Sandy Hill Iron & Brass Works.

ARNO W. NICKERSON on April 1 moved its offices, which have been maintained for several years at 441 Lexington Avenue, New York 17, N. Y., to 175 Main Street, White Plains, N. Y., and will operate under the incorporated name of Arno W. Nickerson, Inc.

J. M. HUBER CORP. has appointed Kenneth C. Crouse administrative assistant to R. H. Eagles, vice-president of the industrial products department. Mr. Crouse will supervise the department's statistical sales records and will be in charge of its advertising and publicity. He will also act as office manager and personnel director.

CORN PROCESSING DIVISION of Clinton Foods has announced the appointment of H. A. Bendixen, formerly sales manager of Primary Bulk Products for Clinton Foods Inc., as general sales manager of the Corn Processing Division.

B. F. GOODRICH CHEMICAL CO. announces the move of its Chicago sales office to Suite 1124, Board of Trade Building, West Jackson Boulevard, Chicago 4, Ill.

CLEARING HOUSE

HELP WANTED

MEN WANTED
POSITIONS OPEN

We can place—manager Fourdrinier machine mill, coarse papers; production supt. board mill; supt. mill making fine papers. Fourdrinier machine; assistant manager cylinder machine mill; Power Plant executive engineer.

Master mechanics and plant engineers; mechanical, electrical and civil engineers; designers and draftsmen; Fourdrinier and Cylinder machine foremen; beater engineers, chemists and chemical engineers and laboratory men; machine and back tenders. Coating foreman for coating of board; salesman to sell paper mill machinery.

LIST YOUR CONFIDENTIAL APPLICATION WITH US

to keep informed of attractive positions open in the pulp and paper mills.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston 8, Mass.
SPECIALISTS IN PLACING PULP AND PAPER MILL EXECUTIVES A-6

WANTED
CHIEF ENGINEER

—to take complete charge of our power plant. Good salary and good working conditions. Contact R. E. Stearns, Empire Box Corp. of Stroudsburg, P.O. Box 54, Stroudsburg, Pa. A-20

HELP WANTED

Boss Millwright for one machine, Midwest Chipboard Mill. Good working conditions and high wages for right man. Reply to Box 51-161 Paper Trade Journal.

A-6

WANTED

Jobbing and paper converting executive familiar with Metropolitan Area of New York; splendid salary for the right man. Charles P. Raymond Service, 294 Washington St., Boston.

A-9

SUPERINTENDENT or GENERAL FOREMAN

10 years experience in semi- or fully automatic vacuum molding of paper pulp products. Will transport family to covered home. Salary commensurate with experience. Excellent business opportunity. State full details of experience, education and personal background and enclose recent snapshot. Confidential.

Address Box 51-152, care Paper Trade Journal. A-13

PRODUCTION MANAGER

Paper Converter New York City with mill sources seeks production manager for initiating department to manufacture any specific converted paper products such as tie folders, dollies, small frozen food cartons, or any other paper specialty for national consumption. Write giving full experience. Address Box No. 51-145 care Paper Trade Journal. A-6

PRODUCTION CHIEF

Paper converting, nationally known. Printing, coating, gumming, laminating, finishing operations. Lifetime position for top-flight production executive. Our people know of this ad. Send full details confidentially to President, Box 50-443, care Paper Trade Journal. TF

HELP WANTED

WANTED
JUNIOR EXECUTIVE

as Assistant to Vice president with particular emphasis on inside sales work. Client prefers man who has been connected with paper companies in kraft paper field, particularly one who has had experience in paper bag end (exclusive of grocery bags).

Prefer College Graduate, excellent mathematician and good sales correspondent. Must be able to make decisions. Attractive salary, depending on background and experience.

Address in confidence, Charles P. Raymond Service, 294 Washington St., Boston, Mass. A-6

WANTED
CHEMIST-ENGINEER

for permanent position in expanding technical sales department. Chicago location. Kraft pulp mill experience desirable. Write Box 51-156, Paper Trade Journal. A-20

HELP WANTED
MACHINE TENDERS

For 84" Fourdrinier Paper Machine Manufacturing Light and Heavy Weight Papers. Must be Experienced in Waxie Paper Furnishes. Living Accommodations Available. Excellent Rate of Pay. Six and Seven Days Per Week. State Age, Experience, Date of Availability, etc. Reply Thomas A. Galeote & Sons, Inc., North Hoosick, New York.

A-20

PRODUCTION MAN

Paper converting, nationally known, folding box manufacturer. Lifetime position for executive with following qualifications: Production engineer, folding box background, mechanical engineering degree, age 28 to 35, live in Philadelphia. Address full details confidentially to Box 51-164, c/o Paper Trade Journal. A-27

WANTED
CHIEF DRAFTSMAN

College Graduate, thoroughly experienced in designing and drafting in pulp and paper manufacturing field. Splendid salary. Charles P. Raymond Service, 294 Washington St., Boston, Mass. A-6

SALARIED POSITIONS $3,500 to $35,000.

We offer the original personal employment service (established 41 years). Procedure of highest ethical standards in individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. —117 Dun Bldg., Buffalo, 2, N. Y. TF

RESEARCH-DEVELOPMENT

Large research and development laboratory has openings for two chemists or chemical engineers with paper mill experience. Ph.D. required for one position. Location: near New York City. Submit outline of qualifications. Address Box 51-137 Care Paper Trade Journal. A-4

HELP WANTED

EXPERIENCED SALES ENGINEER on Fourdrinier and Cylinder Machines and auxiliary equipment, free to travel, by well established machinery builder. In reply state background, experience, etc. Address Box 51-122 care Paper Trade Journal. A-6

PERSONNEL SERVICE ASSOCIATES, 115 State Street, Springfield, 3, Mass. Specialized Confidential Placement Service to the Paper and Allied Industries. Executive—Technical —Sales—General Personnel. Correspondence from employers and employees welcome. Men and positions always available. Personnel Consultants. A-6

WANTED — TOP GRADE SALESMANAGER for an eastern chipboard mill. Fully experienced and capable. Furnish details of experience, capabilities and references. Excellent opportunity. Address Box 51-78 care Paper Trade Journal. TF

WANTED—Working Master Mechanic, for one machine board mill. Must be thoroughly experienced in repairs, maintenance, new installations and have thorough knowledge of boilers. In reply state age, experience and salary desired. Address Box 51-141 care Paper Trade Journal. A-6

YOUNG MAN with Southern experience to organize small personnel-safety section Southern Kraft Mill. Address Box 51-132 care Paper Trade Journal. A-13

EXPERIENCED PAPER MACHINERY DESIGNER with special knowledge of reels, winders and cutters. Excellent opportunity with well established company. Address Box 51-49 care Paper Trade Journal. TF

WANTED — SALES ENGINEER — Experienced in Pulp and Paper Mills, for sales and service work. Excellent opportunity with old established machinery manufacturer. In reply, give resume of education, experience and current salary. Address Box 51-85 care Paper Trade Journal. TF

WORKING SUPERINTENDENT for small, fast growing Eastern mill making lightweight specialties. Cylinder machine experience essential. State qualifications and salary expected. Address Box 51-87 care Paper Trade Journal. TF

WANTED—Tour Boss for one machine board mill making Test Liner, Imitation Kraft Wrapping Paper, Folding and set-up Boxboards. In reply state age, experience and salary desired. Address Box 51-142 care Paper Trade Journal. A-6

GRADUATE MECHANICAL ENGINEER—With sufficient ability and experience in the manufacture of fine papers to be responsible for development program and to design, layout and supervise installation of equipment in midwestern mill. Address Box 51-151 care Paper Trade Journal. My-25

MECHANICAL DRAFTSMAN for general paper mill layout, machinery, piping, etc. Located in North Central Wisconsin. Would consider Mechanical Engineering graduate without experience. State qualifications and salary expected. Address Box 51-154 care Paper Trade Journal. A-20

WANTED — EXPERIENCED, COMPETENT PURCHASING AGENT for an eastern chipboard mill. Must be capable and fully experienced. Furnish details of experience, capabilities and references. Excellent opportunity. Address Box 51-153 care Paper Trade Journal. TF

CORRESPONDENT — Spanish-English with export experience and knowledge of paper industry, to act as Junior Executive Assistant to the Manager of the paper department. Age to 35; good future. Salary range $5000-7000. THE PERSONNEL CO., (Agency), 150 Broadway, New York City. A-6

WANTED—Converting plant desires experienced machine operators for large slitter, sheeter and guillotine flat cutting machines. G. B. Goldman Paper Co., 316 N. 3rd St., Phila., 6, Pa. A-6

Beginning with the issue of May 4, 1951, minimum charge for Classified advertising will be $3.50 per issue.

SITUATIONS WANTED

PLANT MANAGER—Paper and Board and their conversion; wants challenging opportunity. Highly successful in organization; administration; labor relations and high level production. Presently employed. Address Box 51-63 care Paper Trade Journal. A-27

PAPER MILL ENGINEER—Plant Engineer with design experience sulphite pulp, cylinder and Fourdrinier specialties, desires connection. Address Box 51-121 care Paper Trade Journal. TF

PAPER MILL ENGINEER with managerial experience and cost control minded, desires a change offering greater opportunity. Address Box 51-118 care Paper Trade Journal. A-6

SUPERINTENDENT—With long record as a Practical Paper Maker on modern high speed cylinder machines making Boxboard and Specialties. A Production Man. Address Box 51-155 care Paper Trade Journal. A-13

PLANT ENGINEER—Experienced Maintenance and engineering sulphite pulp and paper, desires opportunity with expanding concern. Address Box 51-163 care Paper Trade Journal. TF

FOR SALE

When looking for sale of your machines and products for the paper and cellulose industry on these markets, please contact

IMEX S.A.
Rosda Universidad 12
Barcelona A-6

PAPER COATING MACHINERY MANUFACTURERS—Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New improvements. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

FOR SALE

CURRENT OFFERINGS

42" Moore & White Sheeter, with or without layboy.
58" Finley Sheeter.
84" Hamblet Sheeter, only 6 yrs. old, with 8 roll Back Stand.
100" Horne single knife Sheeter.
68" Oswego mill type Power Cutter, with power back gauge.
Morrison #4 and 32 L. G. Box Stitchers.
Model 45 Economy Hand Baler.

(Send for Current List.)

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18
(Plant at Stamford, Conn.) TF

FOR SALE—74" Knowlton Traveling Shear Cut-off Knife.—Bargain. Address Box 51-105 care Paper Trade Journal. TF

FOR SALE—PAPER COATING RODS—Wire wound EQUALIZERS and blank rods. DE NEVE & CONSLER CO., Box 817, Rochester, 3, N. Y. A-6

FOR SALE

1—112" Cameron, Type 18, 60" rewind.

BEATERS
1—1½ lb. Laboratory Beater.
1—Ditta Iron Tub Laboratory Beater. Beater roll 14" diameter x 10½" face, including motor.

CALENDER STACKS
1—72" 5 roll Calender Stack.
1—3 roll pressure calender—32" x 108".
1—72" 4 roll calender stack. (Extra heavy duty).
1—84"—3 roll.

CHEST
1—Cast Iron Stock Chest, 23' long x 6' high. (With agitator).

CHIPPER
1—96" Murray 4 knife Chipper—anti-friction bearings.

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
4—Jeffrey Hammermill.

CYLINDER MOLDS
1—30" diameter x 72" face.
1—36" diameter x 78" face.
1—36" diameter x 84" face.
1—36" diameter x 90" face.
1—48" diameter x 72" face.
4—36" diameter x 78" face.

DRIVES
1—#6½ Reeves Drive.
1—#4 Reeves Drive
1—Reliance Electric Drive, complete with 5 gear head motors.
2—#3 Reeves Drives (totally enclosed).

V-BELT DRIVE
1—21½" diameter x 7½" face, 5 groove.
1—16½" diameter x 7½" face, 5 groove. (With clutch).

DRYERS
1—Complete unit, consisting of 6 dryers, 30" diameter x 30" face, including frames, gears, anti-friction bearings.
7—24" diameter x 48" face.
1—48" diameter x 91" face.
3—36" diameter x 96½" face.
1—36" diameter x 143" face.
1—24" diameter x 130" face.
1—48" diameter x 70" face.
1—48" diameter x 82" face.
3—Dryers 48" diameter x 134" face.
1—24" diameter x 92½" face.
3—28" diameter x 48" face.
1—84" diameter x 48" face.
1—60" diameter x 60" face.

FELT CONDITIONER
1—140" Nash Felt Conditioner.

FLAT SCREENS
1—6 plate Sharrie Flat Screen.
7—Packer, 12 plate, roller shoe type.

FRAMES
Vertical frames for 100 dryers, 48" diameter, with bearings.

JORDANS
1—Horne Jordan.
2—Noble & Wood Mammoth.

LIME SLUDGE FILTERS
3—IMPCO Lime Sludge Filters, vacuum type, 5' diameter x 4' face.
2—IMPCO Lime Sludge Filters, vacuum type, 5' diameter x 10' face.

MISCELLANEOUS
1—Caustic Mixer.

MOTORS
1—125 h.p., 1700 r.p.m.
1—50 h.p., 850 r.p.m.
Write us regarding your requirements.

PRESSES
3—Sets Primary Presses, complete, 148" face. Anti-friction bearings. Also all types of rolls for 148" wet end.

PULLEYS
Various sizes and assorted pulleys.

PULPERS
1—Jones Pulper. Complete with motor and drive.
1—Noble & Wood Pulper—Iron Tub.

PUMPS
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.
4—Sharrie Brothers circulating pumps, each 4,000 g.p.m.

REEL
1—184" Beloit two bowl reel.

REFINERS
2—#1 Claflin Refiners.

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
1—#2 Bird Rotary Screen.
1—#2A Bird Rotary Screen.
3—#2A Cylinders, only (for Bird Rotary Screens). (Chrome plated).

SAVEALLS
1—#5 Bird Saveall.
2—Savealls, 36" diameter x 136" face cylinder molds, iron end vats.

SHEETERS
2—36" Sheeters.
3—48" Sheeters.
2—58" Sheeters.
1—64" Hamblet.

SHREDDERS
2—Daniels Rag Cutters.
1—Taylor-Stiles Giant Shredder, portable.

SLITTERS & WINDERS
1—42" Cameron—Type 40-A-B.
2—42" Cameron—Type 24-2-A.
1—118" 2 drum Waldron.
2—112" Cameron—Type 18.
1—104" Beloit two drum winder.
1—42" Cameron Constant Tension with pneumatic control.
1—42" Cameron—Type 6.
1—52" Cameron—Type 8-3.
1—42" Cameron—Type 36-3A.
1—92" Cameron—Type 12.
1—42" Johnstone Slitter.
1—92" Moore & White 4 drum winder.

STOCK PUMPS
1—10 x 20 Sharrie Duplex.
1—7 x 16 Sharrie Duplex.
1—10 x 20 Sharrie Triplex.
Advise as to your requirements.

SUCTION BOXES
5—Suction Boxes, 82" drilled face x 9" wide.

VACUUM PUMPS
1—#1 Nash Hytor.

VAT
1—Iron end Vat only, for decker or saveall, suitable for cylinder mold 36 x 130.

YANKEE DRYERS
1—48" Face x 84" Diameter, Frames & Bearings.
1—48" face x 60" diameter including frames and anti-friction bearings.

We are always in the market to purchase your surplus or idle machinery. What have you to offer? Wanted Cylinder and Fourdrinier Machines (complete mills).

Paddy Ross, Pres. **J. J. ROSS COMPANY** Ben Kurz, Treas.
250 Frelinghuysen Ave. Tel.—Bigelow 3-3720 Newark 5, N. J.

FOR SALE

FOR SALE

1—Black Clawson Fourdrinier designed for 180" wire, 70' long. Six Suction Boxes, Suction Couch 25" Dia., Breast Roll 20" Dia., 12" Dia., Stretch Roll. Twenty-five (25) Rubber covered Table Rolls. All anti-friction bearings. Now boxed for shipment. Priced for Quick Sale.

Osborne Paper Mill Equipment Corp.
FULTON, NEW YORK TEL. 54
A-6

FOR SALE

1—15 KW 1150 RPM G. E. Set
1—75 HP 600 RPM Motor
1—7½ HP 850 RPM Motor
1—50 HP 1150 RPM Motor
1—30 HP 1750 RPM Motor
1—10 HP 1160 RPM Motor
1—40 HP 1160 RPM Motor
1—75 HP 900 R-B Motor
1—30 HP 1735 RPM Motor
1—5 HP 1750 RPM Motor
1—75 HP 900 RPM Motor
1—30 HP 900 RPM Motor
1—7½ HP 1200 RPM Motor
1—40 HP 1160 RPM Motor
1—30 HP 900 RPM Motor
1—15 KW DC Generator
1—4A Bird Sawall

Lansdowne Paper Mill, Inc.
Lansdowne, Pa. A-13

FOR SALE

50" Kidder Score Cut Slitter and Rewinder.
Complete—A1 condition.
Immediate delivery.

Address Box 51-147
Care Paper Trade Journal A-6

FOR SALE—1—Ten Roll Lobdell Calender Stack, 110½ inch face with Doctors, Levers and Marshall Drive. Address Box 51-149 care Paper Trade Journal. A-6

For Sale and Wanted
all grades

WASTE PAPER

GIOVE CO., INC.
557 Water St., N. Y. ORegon 3-6140-1-2-3
Inquiries Solicited A-6

BOUGHT — SOLD

Soda Ash—Caustic Soda
Titaniums—Lithopone—Zinc Oxides
Glycols—Cellosolves—Ethanolamines
Bichromates—Dyes—Colors, etc.

CHEMICAL SERVICE CORPORATION
80-84 Beaver St., New York 5, N. Y.
A-6

FOR SALE

57 dandy rolls 10" dia. x 102" both trunnion and journal type. Can be recovered—$50.00 each.

Box 51-137, care Paper Trade Journal.
A-13

FOR SALE

Toilet Winders

2—72" Hudson-Sharp (Surface type winder)
1—84" Giessinger

J. J. ROSS COMPANY
250 Prelinghuysen Ave., Newark 5, N. J.
Tel BIgelow 3-3720 A-6

FOR SALE

PAPER MILL SITE FOR SALE

Centrally located site of about four acres for sale. Water and rail shipping facilities. Frontage on main highway. Low power and water rates, excellent labor market. Within radius of one mile are two mills producing market Groundwood and two mills producing market Sulphite.

Box 535, Thorold, Ontario
A-13

FOR SALE

2—84" 9-roll Supercalender Stacks. Complete with drives.

J. J. ROSS COMPANY
250 Prelinghuysen Ave., Newark, N. J.
Tel BIgelow 3-3720 A-6

FOR SALE

1—Waldron two sided Synchroset Coater —146" wide, practically new.

J. J. ROSS COMPANY
250 Prelinghuysen Ave., Newark, N. J.
Tel. BIgelow 3-3720
A-6

FOR SALE

1—Schultz Automatic Wax Paper Cutter Box Roll Machine. Type AX-103. Rewinds rolls up to 125" in length, 12" width.

Address Box 51-140, care Paper Trade Journal. A-6

FOR SALE—84" Seybold 20th Century Automatic Power Cutter, mill type, with 7½" H.P. A. C. motor; in good working condition, immediately available. Address Box 51-126 care Paper Trade Journal. A-6

WANTED

WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters Hydraulic presses, Sheridan Presses, Dryers. Address Box 51-89 care Paper Trade Journal. TF

WANTED

WANTED

Serviceable Grocery Bag Machine
8 through 20 lb. sizes.
Recent Model Patdevin preferred.

Address Box 50-450, care Paper Trade Journal. TF

WANTED

4—36" diameter x 73" Face Dryers
4—28" diameter x 66" Face Dryers

American Paper Products Company
15 Lane Street, Waltham 54, Mass.
A-27

WANTED—Brightwood Box Machine, Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic presses, Sheridan Presses, Dryers. Address Box 51-88 care Paper Trade Journal. TF

WANTED—One 60" Knife Barker, also one 50"-70" Chipper. Address Box 51-152 care Paper Trade Journal. A-13

WANTED—Sack Machine 3/6 or larger. Address Box 51-156 care Paper Trade Journal. A-6

WANTED—60" to 72" Hamblet Sheeter with layboy, for Defense Work. Other makes considered. Address Box 51-157 care Paper Trade Journal. A-13

WANTED—Used constant-speed rewinder 50" to 60" wide, with or without drive. Address Box 51-159 care Paper Trade Journal. A-30

PAPER MILL WILL TAKE ORDERS for paper from 10 lbs. basis weight to 30 lbs. basis weight. We solicit your inquiry. Address Box 51-158 care Paper Trade Journal. A-13

WANTED—Paper Machine or Paper Mill suitable for .009. Address Box 51-165 care Paper Trade Journal. A-13

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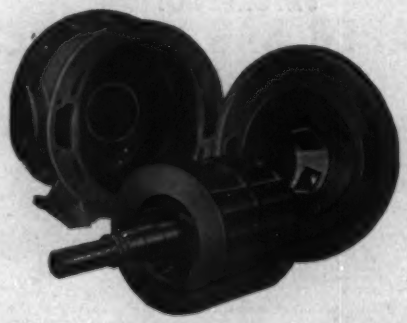

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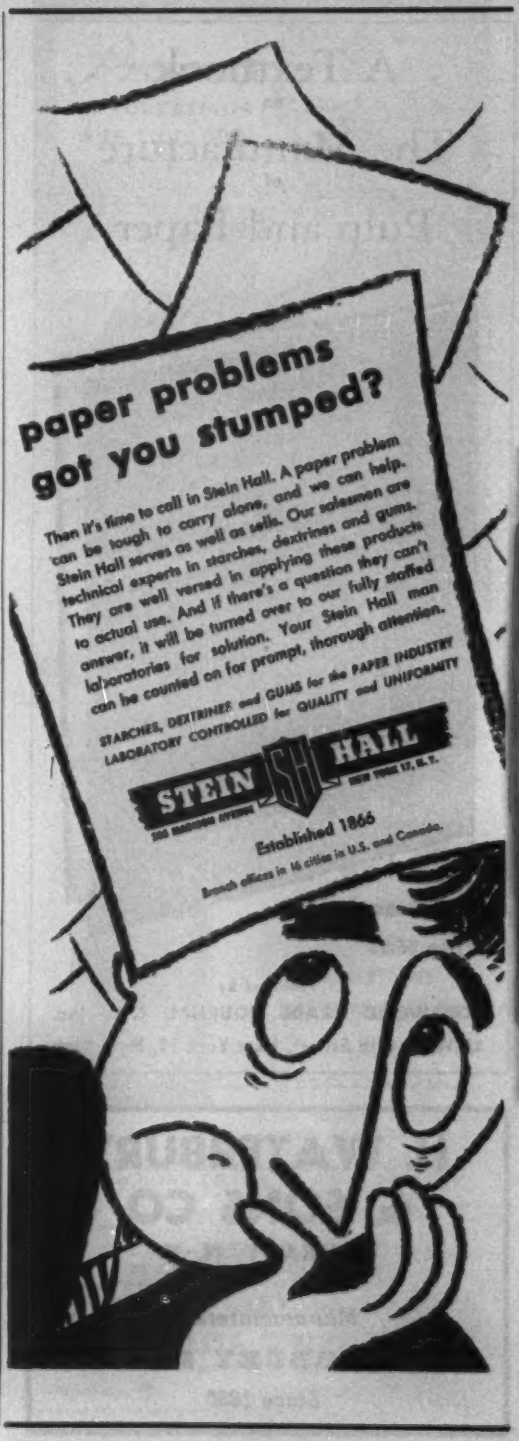
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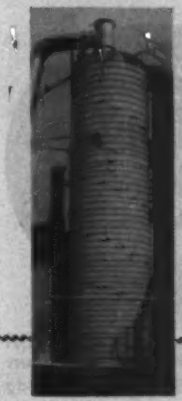

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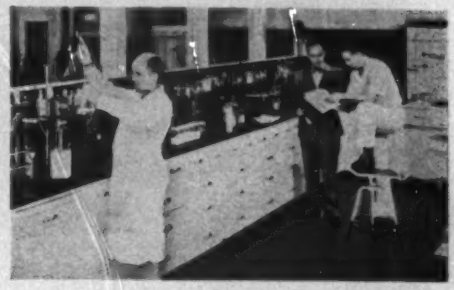

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